one of Two copies

Vol. 889 Number 3

# OFFICIAL GAZETTE

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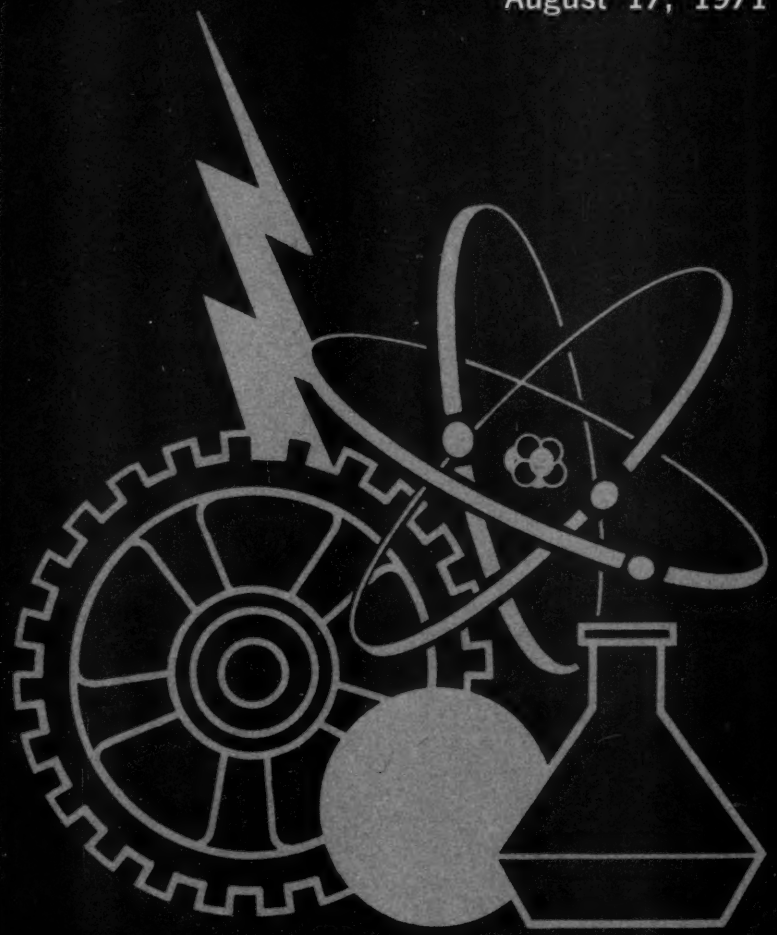
## of the UNITED STATES PATENT OFFICE

A UNITED STATES DEPARTMENT OF COMMERCE PUBLICATION

PATENTS

August 17, 1971



U. S. DEPARTMENT OF COMMERCE

Patent Office

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# OFFICIAL GAZETTE of the UNITED STATES PATENT OFFICE

August 17, 1971 Volume 889 Number 3


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# PATENT OFFICE NOTICES

## Printing of Chemical Patents

In view of financial and scheduling considerations associated with the closing of Fiscal Year 1971, no chemical patents will appear in the patent issues of August 24 and 31, and September 7 and 14, 1971. Chemical patents will again be issued on September 21, 1971.

RICHARD A. WAHL,
July 6, 1971. *Acting Commissioner of Patents.*

## Patent Suits

Notices under 35 U.S.C. 290; Patent Act of 1952

**2,909,134,** J. A. Kniefel, MACHINE FOR LAYING FLEXIBLE PIPE WITH ATTACHED RISERS, **filed** Mar. 22, 1971, D.C., E.D. Calif. (Fresno), Doc. F–504–C, *Joseph A. Kniefel* v. *Agwater, Inc.*

**2,932,509,** H. Zinkin, BODY EXERCISING APPARATUS; **3,116,062,** same, EXERCISING APPARATUS, **filed** Feb. 22, 1971, D.C., W.D. Pa. (Pittsburgh), Doc. 71–166, *Universal Athletic Sales Co.* v. *American Gym, Recreational and Athletic Equipment Corporation, Inc. et al.*

**2,981,689,** E. Albers-Schoenberg, SQUARE LOOP FERRITES, **filed** Feb. 22, 1971, D.C., N.D. Ill. (Chicago), Doc. 71c478, *Electronic Memories & Magnetics Corp.* v. *Control Data Corp.*

**3,018,968,** G. S. Levey, CLOSED SYSTEM RECIRCULATING ASSEMBLY, **filed** Apr. 1, 1969, D.C., S.D. Tex. (Houston), Doc. CA–69–H–287, *The Spee-Flo Manufacturing Corporation* v. *Binks Manufacturing Company.* Final judgment by consent; patent valid and infringed. Injunction issued, Feb. 25, 1971.

**3,048,498,** Juvinall and Marsh, ELECTROSTATIC SPRAY COATING SYSTEM, **filed** Jan. 10, 1969, D.C., N.D. Ill. (Chicago), Doc. 69c47, *Ransburg Electro-Coating Corp.* v. *The De Vilbiss Co. and Rembrandt Lamp Corp.* Judgment, patent valid and infringed. Defendants enjoined, Apr. 19, 1971.

**3,075,288,** Balamuth and Kuris, DENTAL INSTRUMENT; **3,076,904,** Kleesattel, Balamuth and Kuris, ACOUSTICALLY VIBRATED MATERIAL CUTTING AND REMOVING DEVICES; **3,213,537,** same, SUPPLY AND CONTROL APPARATUS FOR VIBRATORY CUTTING DEVICE, **filed** July 14, 1966, D.C., S.D. Fla. (Miami), Doc. 66–856, *Cavitron Corporation* v. *Ultrasonic Research Corporation.* Final judgment, patents valid and infringed, defendants enjoined, Feb. 26, 1971.

**3,076,904.** (See 3,075,288.)

**3,077,724,** Stoddard and Seem, APPARATUS FOR PROCESSING YARNS; **3,091,912,** same, METHOD OF PROCESSING STRETCH YARN AND YARNS PRODUCED THEREBY, **filed** Jan. 26, 1971, D.C., M.D.N.C. (Greensboro), Doc. C–38–G–71, *Universal Textured Yarns, Inc.* v. *Lex Tex Ltd., Inc. et al.* **Same, filed** Mar. 24, 1971, D.C., M.D.N.C. (Greensboro), Doc. C–73–G–71, *Texfi Industries, Inc.* v. *Lex Tex Ltd., Inc. and Leesona Corporation.*

**3,091,360,** B. Edwards, NESTABLE CUP; **3,139,213,** same, **filed** Oct. 14, 1970, U.S. Ct. of App., 1st Cir. Mass. (Boston), Doc. 7731, *Sweetheart Plastics, Inc.* v. *Illinois Tool Works, Inc.* Order of the District Court is affirmed, Feb. 24, 1971.

**3,091,912.** (See 3,077,724.)

**3,091,912,** Stoddard and Seem, METHOD OF PROCESSING STRETCH YARN AND YARNS PRODUCED THEREBY, **filed** Jan. 21, 1971, D.C., S.D. Fla. (Miami), Doc. 71–85–C–JLK, *Lex Tex Ltd., Inc.* v. *Aileen Inc., doing business as Aileen Sportswear.* **Same, filed** Jan. 21, 1971, D.C., S.D. Fla. (Miami), Doc. 71–86–C–PF, *Lex Tex Ltd., Inc.* v. *Texfi Industries, Inc.* (*Texfi-Lively Knits, Inc.*). Notice of dismissal without prejudice, Feb. 26, 1971. **Same, filed** Jan. 21, 1971, D.C., S.D. Fla. (Miami), Doc. 71–87–C–TC, *Lex Tex Ltd., Inc.* v. *Jonathan Logan, Inc.* (*Butte Knite, Inc.*). Plaintiff voluntarily dismisses this action without prejudice, May 18, 1971. **Same, filed** Mar. 10, 1971, D.C., S.D. Fla. (Miami), Doc. 71–385–C–CA, *Lex Tex Ltd., Inc.* v. *Hialeah Knitting Mills, Inc.* **Same, filed** Mar. 10, 1971, D.C., S.D. Fla. (Miami), Doc. 71–386–C–JE, *Lex Tex Ltd., Inc.* v. *Universal Knitting Mills, Inc.* (*Bodin Mills*). **Same, filed** Mar. 10, 1971, D.C., S.D. Fla. (Miami), Doc. 71–387–C–PF, *Lex Tex Ltd., Inc.* v. *Leumas Knitting Mills, Inc.*

**3,096,224,** Goldstein (deceased) and Lichtenstein, CORRUGATED PAPER BOARD PRODUCT, **filed** Jan. 22, 1964, D.C., S.D.N.Y., Doc. 64–C–217, *Tri Wall Containers, Inc.* v. *Continental Can Co., Inc.* Ordered, judgment against the plaintiff dismissing the complaint, Feb. 5, 1971.

**3,110,905,** T. M. Rhodes, TUFTED PILE FABRIC COMPRISING A FLAT WOVEN SYNTHETIC PLASTIC BACKING, **filed** Jan. 4, 1971, D.C., M.D. Ga. (Thomasville), Doc. 923, *Burlington Industries, Inc.* v. *Moultrie Cotton Mills.*

**3,116,062.** (See 2,932,509.)

**3,131,700,** A. Radwan. TOBACCO MOISTENING PROCESS, **filed** Mar. 15, 1971, D.C., N.D. Ill. (Chicago), Doc. 71c644, *John Mohr & Sons* v. *Vacudyne Corp., Arthur N. Lederman.*

**3,139,213.** (See 3,091,360.)

**3,154,808,** Ahlefeld, Baldwin, Hold, Rapetski and Scharer, CONTINUOUS INTERNAL STIFF-GEL MIXER; **3,239,878,** same, **filed** Feb. 3, 1971, D.C., N.D. Ohio (Cleveland), Doc. C71–120, *Farrel Company, Div. of USM Corporation* v. *Intercole Automation, Inc.*

**3,164,129,** P. R. Rigterink, AUTOMATIC NEST GUARD, **filed** Mar. 23, 1971, D.C., S.D. Ind. (Indianapolis), Doc. IP71C–157, *U.S. Industries, Inc.* v. *Anderson Box Company, Inc.*

**3,168,909.** (See 2,971,259.)

**3,182,164,** R. Ironfield, ELECTROMAGNETIC ENERGY SEAL, **filed** Feb. 10, 1971, D.C., N.D. Ohio (Cleveland), Doc. C71–131, *Raytheon Company* v. *Tappan Company and Montgomery Ward & Co., Inc.*

**3,213,537.** (See 3,075,288.)

**3,229,413,** H. K. Bross, TOYS AND RACK ACTUATING MEANS THEREFOR; **3,229,543,** same, RACKS; **D. 205,459,** same, FLEXIBLE PULL STRAP FOR AN AERIAL TOY OR THE LIKE, **filed** Dec. 24, 1970, D.C.N.J. (Newark), Doc. 1728–70, *Kenner Products Company* v. *Helmut Karl Bross and Frank T. Johmann.* Order of dismissal of action, Mar. 26, 1971.

**3,229,543.** (See 3,229,413.)

**3,231,246,** Deen, Friedland and Roost, MIXING APPARATUS FOR ATTACHMENT TO TRACTORS, **filed** Mar. 8, 1971, D.C., S.D. Ill. (Springfield), Doc. C–4768, *American Equipment Corporation* v. *Wikomi Manufacturing Company.*

**3,238,873,** R. C. Allen, DETONATING FUSE TERMINATION; **3,238,876,** same, METHOD FOR THROUGH-BULKHEAD SHOCK INITIATION, **filed** Feb. 3, 1971, D.C., N.D. Calif. (San Francisco), Doc. C–71–227AJZ, *Teledyne McCormick Selph* v. *Lockheed Missiles & Space Company.*

**3,238,876.** (See 3,238,873.)

**3,239,878.** (See 3,154,808.)

**3,243,272,** L. Schmitz, FLASH-BACK ARRESTER FOR WELDING INSTALLATIONS, **filed** Sept. 19, 1967, D.C., E.D. Okla. (Muskagee), Doc. 67–176–C, *General Steel Industries, Inc., doing business as Flex-O-Lite Division* v. *Corning Glass Works, Inc.* Order demand for injunction be denied, action be dismissed on the merits, Mar. 2, 1971.

**3,249,270.** (See D. 204,175.)

**3,257,668.** (See 3,293,663.)

**3,266,173,** G. H. Sheridan, TRAINING APPARATUS, **filed** Feb. 9, 1971, D.C., S.D. Ind. (Indianapolis), Doc. No. IP71–C–77, *Singer-General Precision, Inc.* v. *Visual Edcom, Inc., Aetna Life and Casualty Co., and Aetna Casualty and Surety Co.*

**3,267,587,** Niemiec and Satterlee, HAIR DRYER, **filed** Mar. 26, 1969, D.C. Del. (Wilmington), Doc. 3691, *Rayette-Faberge, Inc.* v. *Schick Electric Inc.* Consent judgment, plaintiff owner of patent; defendant has infringed, Feb. 17, 1971.

**3,269,805,** W. R. Evans, BLANKED STRIP FROM WHICH FEMALE CONTACTS ARE TO BE FORMED FOR ELECTRICAL CONNECTING SYSTEM, **filed** Feb. 27, 1970, D.C., E.D.N.Y. (Brooklyn), Doc. 70–C–253, *Amp, Inc.* v. *North American Specialties Corp.* Consent decree, Mar. 24, 1971.

**3,293,663,** T. D. Cronin, SURGICALLY IMPLANTABLE HUMAN BREAST PROSTHESIS; **3,257,668,** S. A. Braley, SILICONE RUBBER PROSTHETIC EAR FRAME, **filed** Feb. 19, 1971, D.C., E.D. Wis. (Milwaukee), Doc. 71-C-75, *Dow Corning Corporation* v. *Surgitek, Inc. and Medical Engineering Corp.*

**D. 204,175,** B. Zuckerman, GARMENT HANGER; **3,249,270,** same, GARMENT SUPPORT MEANS, **filed** Aug. 12, 1968, D.C., S.D. Fla. (Miami), Doc. 68-957-C-JE, *Mr. Hanger, Inc.* v. *Apparel Plastics, Inc.* Final judgment, patents valid and infringed, defendant enjoined, Mar. 17, 1971.

**D. 205,459.** (See 3,229,413.)

## Erratum

At volume 884, page 971, column 2, line 29 of "Adjudicated Patents," (C.A. Mass.) Anderson et al. Reissue Patent No. 26,672 (76—112), for METHOD OF MAKING BAND SAW BLADE, *Held* claims 1 and 2 valid and infringed, *Contour Saws, Inc.* v. *L. S. Starrett Co.*, 428 F.2d 314, 164 USPQ 208.

Change to:

(C.A. Mass.) Anderson et al. Reissue Patent No. 26,676 (76—112), for METHOD OF MAKING BAND SAW BLADE. Judgment vacated and cause remanded, *Contour Saws, Inc.* v. *L. S. Starrett Co.*, 428 F.2d 314, 164 USPQ 208.

## Certificates of Correction for the Week of Aug. 17, 1971

| | | | |
|---|---|---|---|
| D. 220,167 | 3,549,439 | 3,562,420 | 3,570,037 |
| 3,306,757 | 3,549,497 | 3,562,484 | 3,570,390 |
| 3,374,132 | 3,549,520 | 3,562,607 | 3,570,814 |
| 3,376,221 | 3,549,654 | 3,562,664 | 3,571,842 |
| 3,389,336 | 3,550,078 | 3,562,758 | 3,571,910 |
| 3,400,038 | 3,550,267 | 3,563,105 | 3,571,990 |
| 3,446,844 | 3,550,603 | 3,563,124 | 3,571,991 |
| 3,454,402 | 3,550,985 | 3,563,171 | 3,571,998 |
| 3,462,812 | 3,552,259 | 3,563,813 | 3,572,299 |
| 3,463,749 | 3,552,535 | 3,563,932 | 3,572,790 |
| 3,478,677 | 3,552,547 | 3,563,984 | 3,573,029 |
| 3,479,817 | 3,553,104 | 3,564,086 | 3,573,082 |
| 3,483,180 | 3,553,245 | 3,564,125 | 3,573,231 |
| 3,494,001 | 3,553,420 | 3,564,159 | 3,573,325 |
| 3,499,853 | 3,555,317 | 3,564,193 | 3,573,444 |
| 3,502,664 | 3,555,769 | 3,564,221 | 3,573,457 |
| 3,505,386 | 3,555,805 | 3,564,346 | 3,573,849 |
| 3,507,932 | 3,556,470 | 3,564,466 | 3,573,850 |
| 3,509,681 | 3,556,937 | 3,564,688 | 3,574,116 |
| 3,516,400 | 3,557,590 | 3,564,728 | 3,574,211 |
| 3,516,572 | 3,557,858 | 3,564,870 | 3,574,344 |
| 3,522,416 | 3,558,471 | 3,564,907 | 3,574,537 |
| 3,523,129 | 3,558,473 | 3,565,476 | 3,574,606 |
| 3,524,860 | 3,558,475 | 3,565,638 | 3,574,608 |
| 3,528,836 | 3,558,490 | 3,565,812 | 3,574,755 |
| 3,528,998 | 3,558,607 | 3,565,843 | 3,574,908 |
| 3,532,549 | 3,558,629 | 3,565,896 | 3,575,352 |
| 3,533,405 | 3,558,639 | 3,565,908 | 3,575,643 |
| 3,533,842 | 3,558,696 | 3,566,188 | 3,576,217 |
| 3,535,626 | 3,558,763 | 3,566,477 | 3,576,489 |
| 3,537,993 | 3,559,179 | 3,567,117 | 3,576,782 |
| 3,539,278 | 3,559,921 | 3,567,638 | 3,576,964 |
| 3,541,513 | 3,560,109 | 3,567,810 | 3,577,024 |
| 3,541,625 | 3,560,157 | 3,567,822 | 3,577,159 |
| 3,542,950 | 3,560,540 | 3,568,157 | 3,577,435 |
| 3,542,992 | 3,560,567 | 3,568,221 | 3,577,723 |
| 3,543,654 | 3,560,933 | 3,568,670 | 3,577,995 |
| 3,544,571 | 3,561,089 | 3,568,941 | 3,578,655 |
| 3,545,236 | 3,561,339 | 3,569,670 | 3,578,961 |
| 3,546,677 | 3,561,731 | 3,569,719 | 3,579,490 |
| 3,547,941 | 3,561,953 | 3,569,742 | 3,579,860 |
| 3,548,384 | 3,562,059 | 3,569,922 | |

## Errata

All references to Patent No. 3,596,951 to Fred A. Kovac, for 3-Claw Door Catch, appearing in the OFFICIAL GAZETTE of August 3, 1971 should be deleted as the application was withdrawn from issue and the patent was not issued.

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All references to Patent No. 3,597,004 to Garland B. Keith, for Conduits for Plastics Conveying Systems Having Patterned Indentations in the Internal Surface of the Conduits, appearing in the OFFICIAL GAZETTE of August 3, 1971 should be deleted as the application was withdrawn from issue and the patent was not issued.

## Dedication

3,548,632.—*John B. Damrel, Jr.*, and *Jerry L. Fruit*, Houston, Tex. APPARATUS FOR CALIBRATING ALTIMETERS, AIR SPEED INDICATORS, ETC. Patent dated Dec. 22, 1970. Dedication filed Feb. 12, 1971, by the assignee, *Texas Instruments Incorporated*.

Hereby dedicates to the Public the entire term of said patent.

## Disclaimers

2,725,372.—*Louis M. Minsk*, Rochester, N.Y. LIGHT SENSITIVE UNSATURATED ESTERS OF POLYVINYL ALCOHOL. Patent dated Nov. 29, 1955. Disclaimer filed June 8, 1971, by the assignee, *Eastman Kodak Company*.

Hereby disclaims all of the claims of said patent.

---

3,531,693.—*Joel B. Buice*, Columbia, S.C. ELECTROLYTIC CAPACITOR WITH RUTHENIUM METAL CATHODE SURFACE. Patent dated Sept. 29, 1970. Disclaimer filed June 25, 1971, by the assignee, *General Electric Company*.

Hereby enters this disclaimer to claims 1, 2, and 3 of said patent.

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3,564,763.—*Dale P. Cleveland*, Torrance, and *Thomas R. Wilson*, Manhattan Beach, Calif. YO-YO DOLL. Patent dated Feb. 23, 1971. Disclaimer filed Apr. 30, 1971, by the assignee, *Mattel, Inc.*

Hereby enters this disclaimer to claim 5 of said patent.

# PATENT EXAMINING CORPS

**R. A. WAHL, Assistant Commissioner**
**F. H. BRONAUGH, Deputy Assistant Commissioner**

## CONDITION OF PATENT APPLICATIONS AS OF JULY 27, 1971

| PATENT EXAMINING GROUPS | Actual Filing Date of Oldest New Case Awaiting Action |
|---|---|
| * Date of Oldest Application (New) | |
| **CHEMICAL EXAMINING GROUPS** | |
| GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—M. STERMAN, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices. | 5-04-70 |
| GENERAL ORGANIC CHEMISTRY, GROUP 120—I. MARCUS, Director. Heterocyclic; Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides. | 3-05-70 |
| HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—L. J. BERCOVITZ, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes. | 7-01-70 |
| COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—A. P. KENT, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography. | 8-03-70 |
| SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—W. B. KNIGHT, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes. | *2-24-70 |
| **ELECTRICAL EXAMINING GROUPS** | |
| INDUSTRIAL ELECTRONICS AND RELATED ELEMENTS, GROUP 210—N. ANSHER, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Miscellaneous. | 11-02-70 |
| SECURITY, GROUP 220—R. L. CAMPBELL, Director. Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material. | *2-18-70 |
| INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts. | 6-30-70 |
| ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—W. L. CARLSON, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring. | 7-08-70 |
| PHYSICS, GROUP 280—R. L. EVANS, Director. Photography; Sound and Lighting; Indicators and Optics; Measuring and Testing; Geometrical Instruments. | 6-19-70 |
| DESIGNS, GROUP 290—R. L. CAMPBELL, Director. Industrial Arts; Household, Personal and Fine Arts. | 6-29-70 |
| **MECHANICAL EXAMINING GROUPS** | |
| HANDLING AND TRANSPORTING MEDIA, GROUP 310—A. BERLIN, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Railways and Railway Equipment; Brakes; Rigid Flexible and Special Receptacles and Packages. | 7-02-70 |
| MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—D. J. STOCKING, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus; Plastics Working Apparatus; Plastic Block and Earthenware Apparatus; Machine Tools for Shaping or Dividing; Work and Tool Holders Woodworking; Tools; Cutlery; Jacks. | 5-01-70 |
| AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—A. RUEGG, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination. | 6-03-70 |
| HEAT, POWER AND FLUID ENGINEERING, GROUP 340—C. F. GAREAU, Director. Power Plants; Combustion Engines; Fluid Motors; Pumps; Turbines; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Vaporizing; Temperature and Humidity Regulation; Machine Elements; Power Transmission; Fluid Handling; Lubrication; Joint Packing. | 8-10-70 |
| CONSTRUCTIONS, SUPPORTS, TEXTILES, CLEANING, GROUP 350—T. J. HICKEY, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Receptacles; Supports; Cabinet Structures; Centrifugal Separations; Cleaning; Coating; Pressing; Agitating; Foods; Textiles; Apparel and Shoes; Sewing Machines; Winding and Reeling. | 7-01-70 |

**Expiration of patents:** The patents within the range of numbers indicated below expire during July 1971, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 2,682,658 to 2,685,084, inclusive
Plant Patents..... Numbers 1,288 to 1,293, inclusive

# PATENTS

## GRANTED AUGUST 17, 1971

## GENERAL AND MECHANICAL

**3,599,238**
**SAFETY SASH**
**Frank E. Matthews, Reston, Va., assignor to Matthews Research, Inc., Alexandria, Va.**
**Filed Oct. 30, 1969, Ser. No. 872,583**
**Int. Cl. A41d *3/00***
**U.S. Cl. 2—1** **1 Claim**

A high-visibility, low-cost safety sash which can be worn over the shoulder and around the body of a wearer, and which is shaped to fit snugly and remain in place without any adjustments by wearers of different size and dress.

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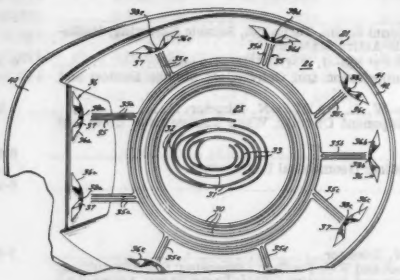
**3,599,239**
**PROTECTIVE HEADGEAR**
**David Tatum, Swarthmore, Pa., assignor to The Fibre-Metal Products Company, Chester, Pa.**
**Filed Oct. 6, 1969, Ser. No. 870,507**
**Int. Cl. A42b *3/00***
**U.S. Cl. 2—3 R** **11 Claims**



An outer shell and a suspension construction for engagement with a wearer's head and supporting the shell in spaced relation thereto, the suspension being specifically configured by shape and thickness for directionally controlled distention under impact applied to the shell, and the shell being provided with resilient means by shape and thickness for obliquely deflecting an article impinging on the shell.

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**3,599,240**
**ARTISTIC OR FANCY WEARING APPAREL**
**Fredun Shapur, London, England, assignor to Trendon Limited, Old Malton, Yorkshire, England**
**Filed June 30, 1969, Ser. No. 837,586**
**Claims priority, application Great Britain, July 30, 1968, 36246/68**
**Int. Cl. A41d *11/00***
**U.S. Cl. 2—75** **6 Claims**

The invention comprises wearing apparel in the form of an inverted sack comprising front and rear panels joined by side gussets, arm holes in the gussets, a viewing opening in the front panel, a characteristic design printed on the front panel and the closed top, as worn, of the sack of a formation to suit

the design. The sack top may be shaped to form pointed or other ears.

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**3,599,241**
**PANTYHOSE**
**Werner Rossler, Margorethen 1, 8972 Sonthofen, Germany**
**Filed Oct. 8, 1969, Ser. No. 864,634**
**Claims priority, application Germany, Oct. 11, 1968, P 18 02 491.4**
**U.S. Cl. 2—224** **2 Claims**

A knitted pantyhose is provided with a panty portion, each side of which extending from the vertical front seam to the vertical rear seam is made of at least two parts which are connected with each other along a vertical line disposed between said vertical front and rear seams. The number of rows of stitches in the part disposed adjacent the vertical rear seam is greater than the number of rows of stitches in the other part which is disposed adjacent the vertical front seam.

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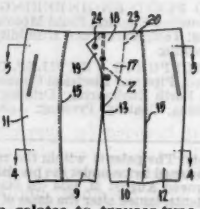
**3,599,242**
**TROUSER GARMENTS**
**Emil Kozdal, 11 Rotherwood Road, Ivanhoe, Victoria, Australia**
**Filed Aug. 5, 1969, Ser. No. 847,606**
**Claims priority, application Australia, Aug. 12, 1968, 41975/68**
**Int. Cl. A41d *1/06***
**U.S. Cl. 2—234** **4 Claims**



The invention relates to trouser-type garments and provides a construction where the leg panels are united along

the normal front and rear crease lines to permit the use of overlapping flaps in the fly area with inner lining portions joined with the garment along the front crease lines.

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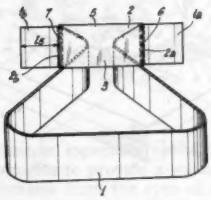
**3,599,243**

## METHOD OF MANUFACTURING AN ELASTIC BELT

**Gilbert Sivel, Nimes, France, assignor to Eminence, Nimes, France**

**Filed Mar. 5, 1969, Ser. No. 804,455**
**Claims priority, application France, Mar. 12, 1968, 143,349**
**Int. Cl. A41f *3/02*; A47f *9/00*; A41f *15/100***
**U.S. Cl. 2—338** **5 Claims**



An elastic belt comprising an elastic strip having its ends joined by a connection element including two leaves hinged along a folding line is made by disposing the connection element astride the oppositely directed ends of an elastic strip, fixing the edges of the said connection element adjacent to the respective ends of the strip, for example by stitching, and then turning the connection element so that the originally inwardly facing surfaces of its leaves face outwardly and vice versa.

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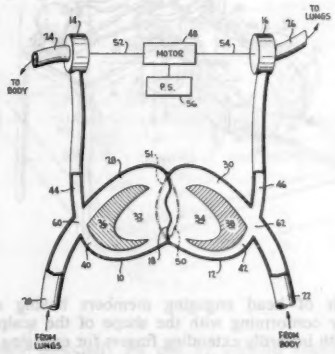
**3,599,244**

## DYNAMIC ACTION VALVELESS ARTIFICIAL HEART UTILIZING DUAL FLUID OSCILLATOR

**Donald E. Wortman, 609 Muriel St., Rockville, Md.**

**Filed Nov. 20, 1969, Ser. No. 878,484**
**Int. Cl. A61f *1/24***
**U.S. Cl. 3—1** **3 Claims**



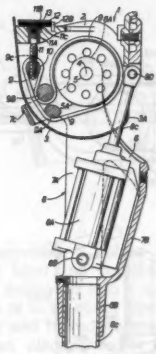

An artificial heart intended for supplementing or temporarily replacing the natural heart for circulating blood through the body. The heart relies on the dynamic flow properties of the blood for its operation, utilizing a unique dual fluid oscillator with a common diaphragm for providing the pulsing action to a pair of pumps that have pressure-volume flow relationships that simulate the natural heart.

**3,599,245**

## ARTIFICIAL LEG HAVING A PRESET AUTOMATIC FRICTION BAND TENSION CONTROL

**Brian G. Blatchford, Basingstoke, England, assignor to Chas. A. Blatchford & Sons Limited, Basingstoke, England**

**Filed June 23, 1969, Ser. No. 835,583**
**Claims priority, application Great Britain, June 26, 1968, 30454/68**
**Int. Cl. A61f *1/04, 1/08***
**U.S. Cl. 3—28** **4 Claims**



An artificial leg in which flexion about the knee axis is controlled in known manner by knee control mechanism of the kind having a friction band looped around a drum, the drum being connected to the shin of the leg and the friction band to the thigh. Wear in the knee control mechanism, and "bedding down" of its component parts, is compensated by a preset clock-type coil spring, which automatically adjusts tension applied to the friction band.

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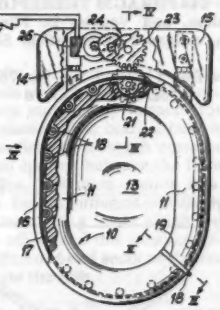
**3,599,246**

## WATER-CLOSET-SEAT-CLEANING DEVICE

**Angelo Bramati, and Paolo Pierlorenzi, both of 46 Via Marchetti, 60100 Ancona, Italy**

**Filed Oct. 1, 1968, Ser. No. 764,224**
**Claims priority, application Italy, Oct. 4, 1967, Mar. 23, 1968, 816,691;207-A/68**
**Int. Cl. E03a *11/00, 9/00***
**U.S. Cl. 4—233** **6 Claims**



An annular seat designed to cover a water closet bowl and having a human-body-contacting upper face, comprising a chain arranged in closed loop thereabout, sweeper means secured to a point of such chain and including a cleaning and disinfecting pad positioned for frictionally engaging said upper face and cleaning the same as progressed thereon and about upon causing said chain to progress in the path defined

by its loop, and motor means drivingly connected to said chain for rotating same and causing said pad to sweep along said face.

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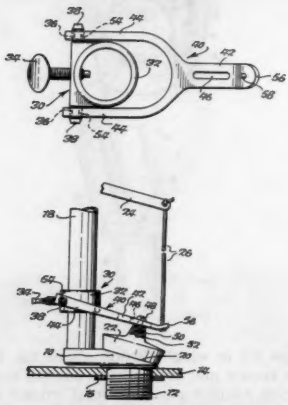
**3,599,247**

## FLUSH VALVE ASSEMBLY

**Dan Kamphausen, Littleton, Colo., assignor to Twentieth Century Products Corporation, Englewood, Colo.**

**Filed July 18, 1969, Ser. No. 839,929**
**Int. Cl. E03d** *1/34*
**U.S. Cl. 4—57** **8 Claims**



A toilet flush valve assembly having a bracket releasably secured to an overflow pipe of a flush tank and a lever pivotally mounted on said bracket carrying a valve member adapted to seat on either an inclined or a horizontal seating surface. The lever is provided with an angled end portion having a tapered opening for receiving an actuating cord. The lever is pivotally mounted on the bracket by means of openings which receive projections extending radially outwardly from the bracket. Sufficient play is permitted between the lever openings and the projections in longitudinal and lateral directions to allow the valve member to properly seat itself.

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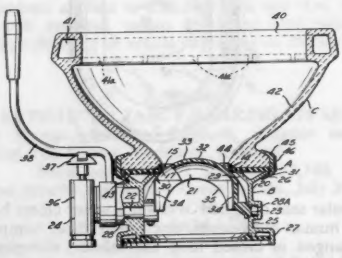
**3,599,248**

## TRAPLESS TOILET BOWL FIXTURE AND RING DIAPHRAGM THEREFOR

**Howard A. Fulton, and Vaughn D. Flinner, both of Big Prairie, Ohio, assignors to Mansfield Sanitary Inc., Perrysville, Ohio**

**Filed Dec. 11, 1968, Ser. No. 782,808**
**Int. Cl. E03d** *11/10*
**U.S. Cl. 4—79** **6 Claims**



A trapless water flush toilet bowl plumbing fixture including a trapless bowl mounted on a waste water discharge unit and a water seal ring diaphragm positioned between the bowl and waste water discharge unit, the said discharge unit having a ball valve mounted therein for a water seal frictional engagement with said diaphragm when the said ball valve is closed.

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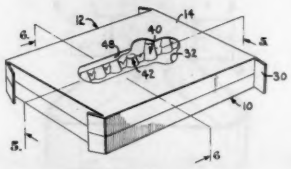
**3,599,249**

## DISPOSABLE BEDPAN

**James S. Reed, Lawrence, Kans., assignor to GMR, Inc., Lawrence, Kans.**

**Filed Mar. 27, 1969, Ser. No. 811,094**
**Int. Cl. A61g** *9/00*
**U.S. Cl. 4—112** **6 Claims**



A disposable bedpan comprising a folded box of initially flat cardboard material and a separate waste-receiving tray of disposable material. Integral spaced-apart projections in the tray support the box at the desired contour under the weight of a patient. Each side of the box has a waste-receiving opening and the openings are of different sizes to permit reversal of the box with respect to the tray to accommodate either children or adult patients.

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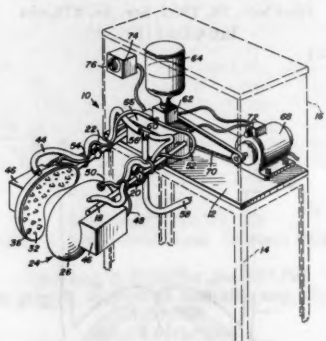
**3,599,250**

## SHAMPOO MACHINE

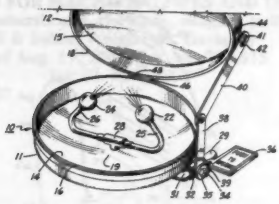
**Gracie H. Colomb, 1009 East St. Mary Blvd., Lafayette, La.**

**Filed Oct. 16, 1969, Ser. No. 866,959**
**Int. Cl. A47d** *19/00*
**U.S. Cl. 4—159** **4 Claims**



A pair of head engaging members having a contour generally conforming with the shape of the scalp and provided with inwardly extending fingers for engaging the scalp, a vibrator for vibration thereof and a hollow interior communicated with a source of shampoo and water together with apertures directing the cleaning solution and rinse water toward the scalp. The head engaging members are supported on adjustable arms which are vibrated or oscillated in a manner to scrub and massage the scalp and a shampoo dispenser is provided for introducing shampoo into a supply conduit at the appropriate time during a shampoo cycle thereby enabling a hairdresser to be occupied with other duties while a person is receiving a shampoo.

3,599,251
COVERED EYEWASH FOUNTAIN
Allen C. Wright, Moraga, Calif., assignor to Haws Drinking Faucet Company, Berkeley, Calif.
Filed June 6, 1969, Ser. No. 831,100
Int. Cl. A47k *1/04*
U.S. Cl. 4—166 4 Claims



An eyewash fountain especially useful in industrial and laboratory environments to provide a water discharge suitable for flushing irritants from the eyes of a workman. The fountain includes a bowl having a chamber provided with at least one nozzle therein through which an eye-bathing flow of water can be discharged for so flushing the eyes of a workman. A cover ordinarily closes the chamber and overlies such nozzle, and a valve connected in the water supply line controls the flow of water to the nozzle. Operating mechanism interconnecting the valve and cover move the same concurrently upon manual manipulation of a lever provided for this purpose so that when the valve is closed, the cover is in its chamber-covering position and when the valve is open the cover is in its chamber-uncovering position.

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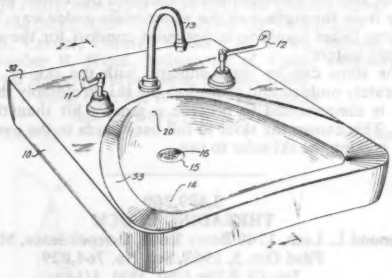
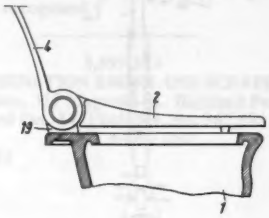
3,599,252
LAVATORY
E. Peter Robare, Louisville, Ky., assignor to American Standard Inc.
Continuation of application Ser. No. 618,669, Feb. 27, 1967, now abandoned. This application Dec. 24, 1969, Ser. No. 884,778
Int. Cl. A47k *1/04*
U.S. Cl. 4—166 4 Claims



A lavatory especially for use by persons confined in a sitting position in wheelchairs and the like, said lavatory having an integral extended body portion cantilever supported by a concealed arm support system extending from the wall adjacent to the rear of the lavatory of a room containing the lavatory, and having substantially no underlying obstructions which would prevent said persons from easy access to the lavatory. The lavatory also includes a drain slope defining the opening of its bowl, which serves not only to allow splash water to drain back into the bowl, but also as a splash deflector.

3,599,253
TOILET FITTING
Hans Maisch, Rotenfels, Germany, assignor to Eisenwerke Gaggenau GmbH, Gaggenau, Germany
Filed Sept. 18, 1969, Ser. No. 858,971
Claims priority, application Germany, Feb. 25, 1969, P 19 09 300.6
Int. Cl. E03d *9/05*; A47k *13/00*
U.S. Cl. 4—213 5 Claims



A toilet fitting comprising a hollow seat adapted to be mounted on a toilet bowl and containing suction orifices through which air is drawn off into a suction chamber and thence to atmosphere or to an outlet pipe by an air extractor. To simplify servicing and to reduce noise the air extractor comprising a fan, an electric motor and the necessary switchgear is mounted in a replaceable cartridgelike device which is housed in a hollow extension of the seat.

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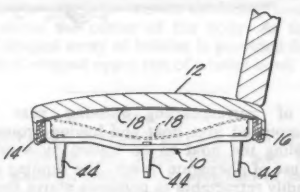
3,599,254
FRAME RAIL ATTACHMENT FOR SEATING STRUCTURES
Albin J. Niewulis, Lexington, Ky., assignor to Hoover Ball and Bearing Company, Saline, Mich.
Filed Dec. 6, 1968, Ser. No. 781,838
Int. Cl. A47c *7/00*, *23/00*
U.S. Cl. 5—264 6 Claims



An attachment for the frame rails in seating structures for maintaining the rails in a predetermined spaced relation comprising a one piece metal body formed from a thin gauge rolled or formed section. The body is bent so as to form an elongated main section, of a length corresponding substantially to the desired spacing between the frame rails, and upturned end sections. The main section is a cross-sectional shape to provide for an efficient utilization of the metal therein to resist seat spring loads which tend to move the rails toward each other, and this same cross-sectional shape is utilized in the upturned end sections to preclude squirming of the attachment on the rails.

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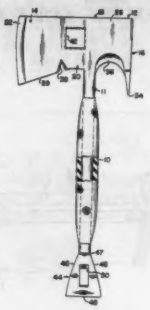
3,599,255
COMBINATION TOOL
Thomas P. Carroll, Sr., 444 32nd St. N.W., Canton, Ohio
Filed Oct. 21, 1968, Ser. No. 769,214
Int. Cl. B25f *1/00*; B25d *1/00*, *17/10*
U.S. Cl. 7—8.1 R 1 Claim

A combination tool having an insulated handle and a head with a top, bottom, front and rear and section attached at one end of the handle. A cutting edge is formed along the edge of the front section of the head. The thickness of the

head increases from the cutting edge to the rear section which terminates in a blunt rear face. The sides of the rear face converge downwardly to form a prying point. A concavously shaped ripping edge is formed along the bottom of the head between the prying point and the handle. An aperture in the head is adapted to fit a water hydrant valve and a nail puller is formed by a V-shaped indentation along the bottom edge of the head between the front section and the handle. The other end of the handle has a wedge-shaped projection which acts as a wrecking bar head and an aperture in the wrecking bar head is adapted to fit a gasline valve.



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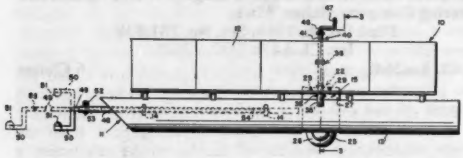
**3,599,256**
**BOAT WITH RUNNING GEAR**
Noble L. Carroll, Jr., Box A1, Barryton, Mich.
Filed Apr. 2, 1970, Ser. No. 25,165
Int. Cl. B63c *13/00*
U.S. Cl. 9—1 T 7 Claims



A pair of corresponding running gear assemblies detachably mounted in a boat and having ground-engaging wheels enabling the boat to be trailed by a draft vehicle without the use of a separate trailer. The running gear assemblies are readily retractable to positions above the water line when the boat is afloat or the running gear assemblies may be readily detached and completely removed from the boat.

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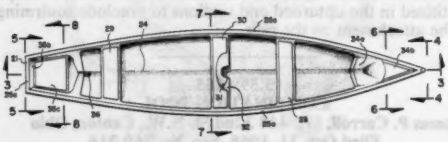
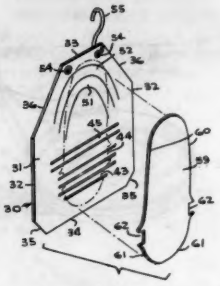
**3,599,257**
**CANOE AND METHOD OF CONSTRUCTION THEREOF**
Keith Daune Erickson, 3727 South 900 East, Salt Lake City, Utah
Filed Sept. 22, 1969, Ser. No. 859,956
Int. Cl. B63b *5/24*
U.S. Cl. 9—6 5 Claims



A resinous canoe having preformed, adhesively secured inner and outer hull units, foam flotation, a reinforced keel constructed to add to the buoyancy of the craft and a unique method of construction including preforming flotation blocks to insure complete usage of all available space for flotation.

**3,599,258**
**COMBINATION HANDS-AND-FEET SWIMMING FINS**
Steve A. Murawski, 13422 Ave. K., Chicago, Ill.
Filed Aug. 13, 1969, Ser. No. 849,656
Int. Cl. A63b *31/04, 31/10, 31/18*
U.S. Cl. 9—307 2 Claims



A swimming device that includes a member made of a flexible material that has bands or straps thereon for engagement by the user's hands or feet.

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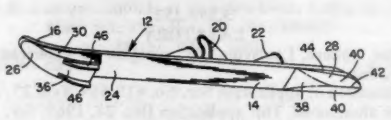
**3,599,259**
**WATER SKI IMPROVEMENT**
Daniel C. Shewmon, 3702 Mount Laurel Road, Cleveland Heights, Ohio
Filed Nov. 20, 1969, Ser. No. 878,384
Int. Cl. A63c *15/00*
U.S. Cl. 9—310 A 12 Claims



A water ski having a pair of steps affixed to the underside of the ski close to the front and rear ends of the ski. The steps are remote from the center of the ski where the skier stands, and are dimensioned to maintain the center generally away from the surface of the water while under way. The ski thereby flexes resulting in optimum comfort for the rider in choppy waters.

The steps can be made integral with the ski, or can be separately molded and affixed to the ski. Preferably the front step is dimensioned to provide a greater lift than the rear step. This causes the skier to fall backwards in the event of a spill making the ski safer to use.

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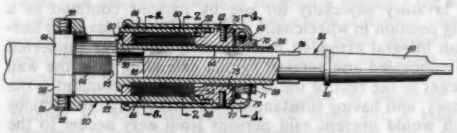
**3,599,260**
**THREADING CHUCK**
Raymond L. Lesh, 1740 Berry Road, Independence, Mo.
Filed Oct. 3, 1968, Ser. No. 764,829
Int. Cl. B23g *1/00, 5/06, 5/14*
U.S. Cl. 10—89 6 Claims



A threading chuck for use with a machine tool has a pair of relatively rotatable, coaxial elements, one of the elements

having a threading tool secured thereto. The other element is mounted on the work axis of the machine. A clutch is interposed between the elements and is adapted, when engaged, to hold the elements against relative rotation. However, when the clutch is released, the element carrying the threading tool is permitted to rotate relative to the other element, thereby discontinuing the threading operation.

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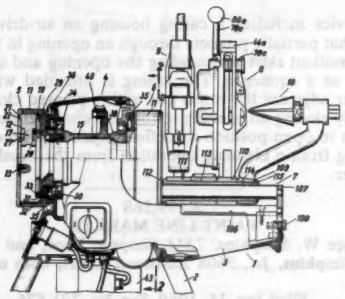
3,599,261

**APPARATUS FOR MACHINING PIPES AND THE LIKE**

Artur Fohl, Haubersbronn, Germany, assignor to Rems-Werk Christian Foll & Sohne, Waiblingen, Germany

Filed Aug. 19, 1968, Ser. No. 753,615
Int. Cl. B23g 1/00
U.S. Cl. 10—107 4 Claims



An apparatus for clamping and rotating workpieces such as pipes and for performing machining operations, such as pipes, in which the workpiece is clamped by devices which have clamp levers pivoted at their outer ends to a rotary housing and have their inner workpiece engaging ends inclined and in which the machining operation for cutting threads is carried out by cutting elements moveable radially on a support therefor. The cutting elements are spring biased toward retracted position and are held in cutting position by a stop element which is adapted to be moved to ineffective position by movement of a member which is engaged and moved by the end of a workpiece machined.

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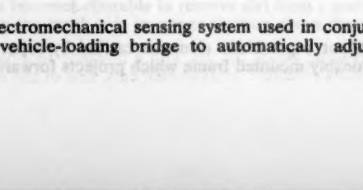
3,599,262

**ATTITUDE SENSING SYSTEM FOR USE DURING LOADING AND UNLOADING OF VEHICLES**

Victor H. Carder, Carmel; Sheldon K. Green, Salinas, and Christopher R. Wood, Salinas, all of, Calif., assignors to Cochran Western Corporation, Salinas, Calif.

Filed Apr. 21, 1970, Ser. No. 30,454
Int. Cl. B65g 11/00, 67/02
U.S. Cl. 14—71 14 Claims



An electromechanical sensing system used in conjunction with a vehicle-loading bridge to automatically adjust the orientation of the bridge in accordance with changes in attitude of elevation and/or angular displacement of a vehicle during loading and unloading thereof. Means for raising or lowering the loading bridge or tilting its forward end to maintain the bridge properly aligned with an access door of a vehicle is controlled by signals from limit switches actuated by a linkage mechanism responsive to vehicle attitude changes. A four bar linkage mechanism is actuated by a sensor arm operatively engaged with the vehicle. The disclosed system has particular utility in conjunction with loading and unloading aircraft, but its utility with other cargo carrier-type vehicles also is recognized.

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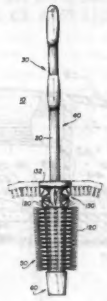
3,599,263

**COMBINATION BRUSH AND SCRAPER**

Samuel S. Cheiten, 317 Magnolia St., Highland Park, N.J.

Filed Oct. 14, 1968, Ser. No. 767,191
Int. Cl. A47l 17/02
U.S. Cl. 15—111 8 Claims



A combination brush and scraper, particularly suited for cleaning toilet bowls, comprising an elongated body having a specially shaped scraper at the end remote from the handle and including a region of bristles extending back from the scraper to about the center of the body. At this point, a generally C-shaped array of bristles is provided for engaging the generally C-shaped upper rim of a toilet bowl.

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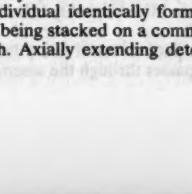
3,599,264

**LAMINATED ROTARY BRUSH APPARATUS**

Courtland N. Smith, Jr., Glen Ridge, and Edward L. Verhagen, Rahway, both of, N.J., assignors to Sherman Car Wash Equipment Co., Palmyra, N.J.

Filed Aug. 4, 1969, Ser. No. 847,087
Int. Cl. A46b 3/16, 9/02
U.S. Cl. 15—181 5 Claims



A laminated rotary brush is disclosed wherein bristle tufts are coupled to individual identically formed disk members, the disk members being stacked on a common shaft to define a cylindrical brush. Axially extending detent portions inter-

connect adjacent disk members to preclude relative rotation therebetween, but permit positioning of adjacent disk members in a plurality of selectable relative angular positions, such positions providing, selectively, a brush with axially aligned or angularly offset bristles. The disk members, in one form of the invention, include a hub portion provided with angularly spaced keyways, whereby the keyways of the individual disk members may be aligned for securement to a common shaft-engaging key, regardless of the selected alignment of the bristles.

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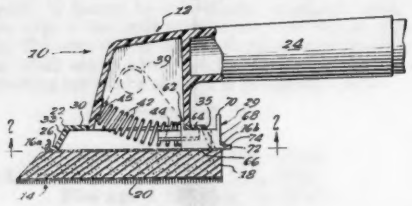
**3,599,265**
**PAINT APPLYING INSTRUMENT WITH RELEASE LATCH**

Giacinto C. D'Ercoli, Park Forest, Ill., and Albert A. Mlachnik, Milwaukee, Wis., assignors to E Z Painter Corporation

Filed Mar. 16, 1970, Ser. No. 19,956
Int. Cl. A46b 5/00; B25g 3/18, 3/38
U.S. Cl. 15—210 R 16 Claims



A pad-type painting applicator of the type having a handle and a replaceable applicating pad, characterized by the provision of a movable latch member on the handle for releasably retaining the applicator pad on the handle portion.

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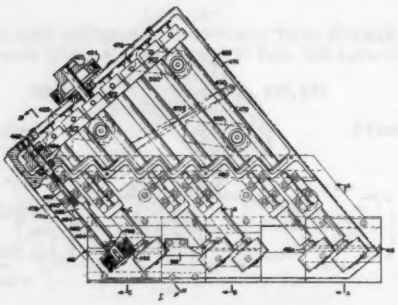
**3,599,266**
**APPARATUS FOR BRUSHING AND POLISHING ZIPPER CHAIN**

Guido Perrella, Montreal, Quebec, Canada, assignor to Dynacast International Limited, Glasgow, Scotland

Division of Ser. No. 637,518, May 10, 1967, Pat. No. 3,482,301.
Filed July 7, 1969, Ser. No. 858,222
Int. Cl. B08b 1/02
U.S. Cl. 15—21 D 1 Claim

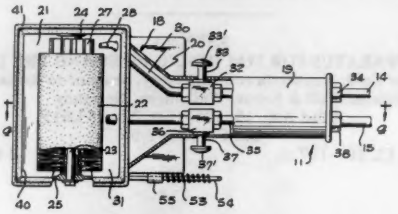


A brushing and polishing assembly for use in the manufacture of zipper chain. The assembly includes a body having a chain guide path and a number of brushing members disposed over the path to brush and polish exposed surfaces of the chain as it passes through the assembly.

**3,599,267**
**WINDSHIELD SCRUBBER**

Robert N. Faires, 565 North Elspeth Way, Covina, Calif.

Filed June 9, 1969, Ser. No. 831,458
Int. Cl. A46b 13/04
U.S. Cl. 15—24 8 Claims



A device including a casing housing an air-driven rotary brush that partially projects through an opening in the casing and a resilient skirt surrounding the opening and capable of serving as a squeegee. The casing is provided with a trap chamber adjacent the brush and with a pivoted closure shoe normally closing an opening to the trap chamber but adapted to pivot to open position to deflect liquid and other residue resulting from a cleaning operation from the brush into the chamber.

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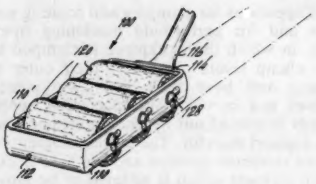
**3,599,268**
**PAINT LINE MARKER**

Lawrence W. Simpkins, 7344 Simpson Lane, and Lawrence W. Simpkins, Jr., 5608 Eastwood Court, both of Clinton, Md.

Filed Jan. 16, 1969, Ser. No. 791,576
Int. Cl. B44d 3/22, 3/28
U.S. Cl. 15—230.11 3 Claims



This is a paint line marker which is especially useful in marking parking lots for vehicles and small confined areas such as pedestrian crossways at road intersections. Basically, the concept involves the in-line mounting of plural paint rollers in a frame, wherein the particular rollers are self-wiping, continuously self-aligning to ensure the accurate positioning of the device as a paint line is deposited, substantially indelibly.

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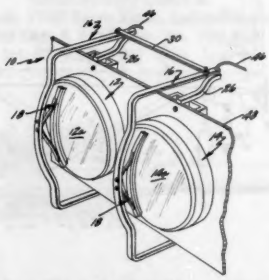
**3,599,269**
**HEADLIGHT-CLEANING APPARATUS**

R. J. Max Congdon, 0-1421 Baldwin, Jenison, Mich.

Filed Oct. 25, 1968, Ser. No. 770,502
Int. Cl. B60s 1/66
U.S. Cl. 15—250.04 5 Claims



Resilient wiper blade elements carried by a portion of a reciprocably mounted frame which projects forwardly of the

face or front wall of a headlight on an automobile or the like, with a fluid-transfer conduit carried by the frame and communicating with the wiper, and with the wiper arranged to apply cleaning fluid to the face of the headlight while simultaneously reciprocating across the same to clean it.

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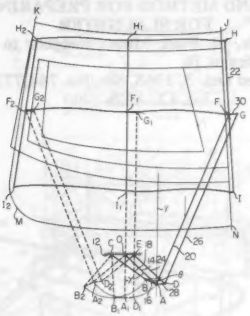
**3,599,270**
**WINDSHIELD WIPER**
**Yoichi Mori, Yokohama, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan**
**Filed Feb. 4, 1970, Ser. No. 8,526**
**Claims priority, application Japan, Feb. 7, 1969, 44/8771**
**Int. Cl. A47l *1/00*; B60s *1/02***
**U.S. Cl. 15—250.23** **4 Claims**



A vehicle windshield wiper assembly of a quadric chain mechanism type, having a wiper blade adapted for sweeping practically the total area of the windshield by oscillating along a horizontal, nearly trochoidal path and maintaining a position perpendicular or nearly perpendicular to the horizontal line throughout the sweeps. The nearly trochoidal curve along which the centerpoint of the wiper blade moves is drawn by using a rotatable crank arm and a rotatable guide arm which are hingedly connected by a rod. The wiper blade is held in a position perpendicular or nearly perpendicular to the horizontal line by a rod held parallel to the crank arm and a linkage structure formed by the wiper arm and three connected rods.

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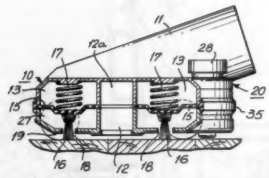
**3,599,271**
**MULTIPURPOSE VACUUM CLEANER NOZZLE**
**Hans Georg Ljung, Jakobsberg, and Torsten Birger Palmeth, Sollentuna, both of, Sweden, assignors to Aktiebolaget Electrolux, Stockholm, Sweden**
**Filed Feb. 2, 1970, Ser. No. 7,703**
**Claims priority, application Sweden, Feb. 4, 1969, 1450/69**
**Int. Cl. A47l *9/02***
**U.S. Cl. 15—339** **12 Claims**



This invention relates to a multipurpose vacuum cleaner nozzle having a suction inlet which is movable over a porous object like a rug to remove dirt therefrom. A brush is mounted on the nozzle at the vicinity of the suction inlet for movement between upper and lower positions, the brush in its lower position being below the suction inlet and operable to remove dirt from a nonporous object like a floor. The suction inlet becomes operable to remove dirt from a porous object when the brush is in its upper position above the suction inlet.

The brush is moved between its upper and lower positions by pneumatically operated mechanism having a control chamber connected by a passageway to a region of the nozzle in which the air normally is at a partial vacuum. A valve, which is connected in the last-mentioned passageway, is kept in its closed position by a sensing member when it probes a nonporous object over which the nozzle is moved and is actuated to its open position by the sensing member when it probes a porous object over which the nozzle is moved.

When the valve is open and the air in the chamber is at a first pressure which is a partial vacuum, the pneumatically operated mechanism functions to move the brush to its upper position against the biasing action of spring means. When the valve is closed and the air in the chamber is at a second higher pressure, which can be ambient air at atmospheric pressure, the mechanism functions to move the brush to its lower position with the biasing action of the spring means.

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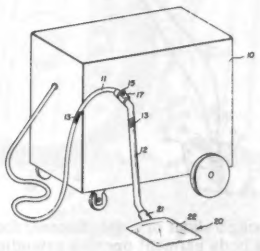
**3,599,272**
**VACUUM MOP**
**John T. Merrick, 629 Thurston Road, Rochester, N.Y.**
**Filed Jan. 15, 1970, Ser. No. 2,983**
**Int. Cl. A47l *11/29***
**U.S. Cl. 15—321** **6 Claims**



A powered vacuum mop has the cleaning liquid line arranged as a flexible tube inside the vacuum hose and wand and has a pushbutton valve on the upper end of the wand. Also, an improved cleaning tool has a main housing receiving the wand, and a separator plate under the main housing closes off all the space under the housing except narrow vacuum intake openings along the front and rear edges of the housing. A perforated plate under the separator plate between the intake openings carries a porous scrubbing tool, and a squeegee is arranged in each of the intake openings. The cleaning liquid line leads to a liquid passageway extending through a separator plate and into a perforated tube extending over the perforated plate.

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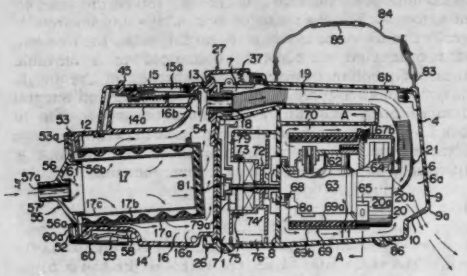
**3,599,273**
**VACUUM CLEANER**
**Konomu Shirayanagi, Yokohama-shi; Yoshitoma Ijima, Matsudo-shi; Kosaku Urano, Tokyo; Sadao Kobayashi, Tokyo; Tsuneo Kozuki, Machida-shi; Yutaka Tanigawa, Tokyo; Akio Watanabe, Kodaira-shi; Terunobu Takahashi, Tokyo, and Tsuneo Sakagami, Kamakura-shi, all of, Japan, assignors to Tokyo Denki Kabushiki Kaisha, Tokyo, Japan**
**Filed Oct. 1, 1968, Ser. No. 764,225**
**Claims priority, application Japan, Apr. 17, 1968, Apr. 17, 1968, May 28, 1968, May 28, 1968, June 26, 1968, June 26, 1968, July 23, 1968, July 23, 1968, July 23, 1968, 43/31,307; 43/31,308; 43/44,079; 43/44,080; 43/53,665; 43/53,666; 43/62,603; 43/62,604; 43/62,605**
**Int. Cl. A47l *5/24***
**U.S. Cl. 15—326** **19 Claims**

A vacuum cleaner consisting of a body separable into two

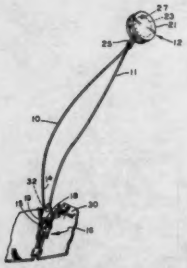
sections, wherein the airpaths of the sections are serially joined by a flexible hose to be housed in a tubular chamber formed in the sections.



### 3,599,274
### ACUTATOR FOR SLIDE FASTENER

Marion Donovan, 435 E. 52nd St., New York, N.Y.

Filed Dec. 6, 1968, Ser. No. 781,780
Int. Cl. A44b *11/00, 19/26*
U.S. Cl. 16—110 5 Claims

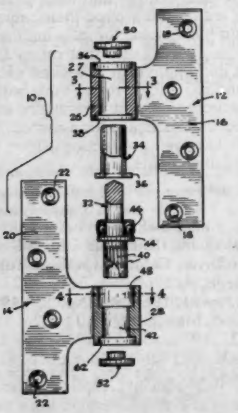


Means for moving a slider of a slide fastener for joining opposed edges of a body garment opening extending down the back of said garment between the waist and the neck, and including a flexible cord of elastic extensible material and provided at one end with means for detachably securing said cord to the slider, and a finger-engaging piece at the free end of the cable.

### 3,599,275
### HINGE STRUCTURE

Kurt H. Granzow, Sterling, Ill., assignor to Lawrence Brothers, Inc., Sterling, Ill.

Filed Jan. 2, 1970, Ser. No. 38
Int. Cl. E05d *11/04*
U.S. Cl. 16—136 10 Claims

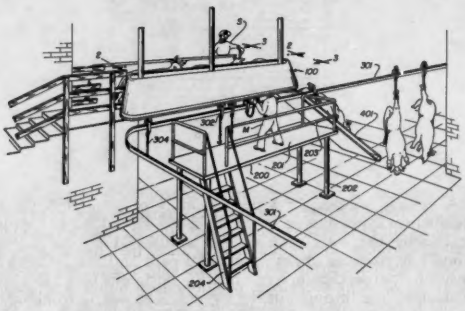


This invention relates generally to improvements in door hinges and more particularly to the improvements in door hinges of the type commercially known as "Paumelle" hinges. The hinge structure disclosed herein is representative of one embodiment of the invention and comprises a pair of cooperatively disposed hinge members each having a hinge plate and a hinge knuckle positioned intermediate the upper and lower margins of each plate. One plate is for attachment to a door-supporting frame and the other is designed for attachment to a fixed door frame structure such as a door jamb. The door hinge knuckle adjacently superimposes the other hinge knuckle and a hinge pin extends through and is secured against axial displacement with respect to both of the knuckles. Hinge knuckle caps are frictionally attached to the lower and upper extremities of the combined knuckles.

### 3,599,276
### APPARATUS AND METHOD FOR PREPARING ANIMALS FOR SLAUGHTER

Everett Edwards, St. Paul, Minn., assignor to Armour and Company, Chicago, Ill.

Filed Oct. 3, 1968, Ser. No. 764,773
Int. Cl. A22b *1/00*
U.S. Cl. 17—1 5 Claims

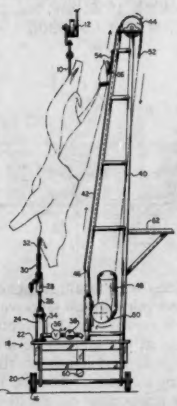


An apparatus and method for preparing meat animals for slaughter in which the animals are confined in an elevated bottomless pen, stunned and shackled while in the pen, and discharged directly to a conveyor rail for slaughter.

### 3,599,277
### HOG SKINNING

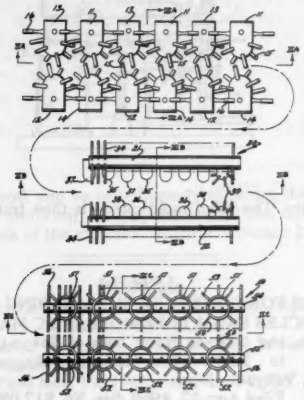
Kenneth J. Brown, P.O. Box 1534, Plainview, Tex.

Filed Oct. 27, 1969, Ser. No. 869,828
Int. Cl. A22b *5/20*
U.S. Cl. 17—21 9 Claims



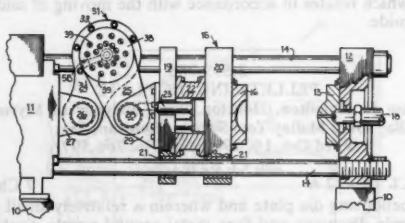
A hog hung by the hamstrings is skinned by cutting the skin from the belly, legs, and head, then holding the head down while pulling the hide upward.

3,599,278
METHOD FOR PICKING POULTRY
Edward J. Crane, Ottumwa, Iowa, assignor to International Agri-Systems, Inc., Ottumwa, Iowa
Filed July 15, 1969, Ser. No. 841,807
Int. Cl. A22c 21/02
U.S. Cl. 17—47 3 Claims



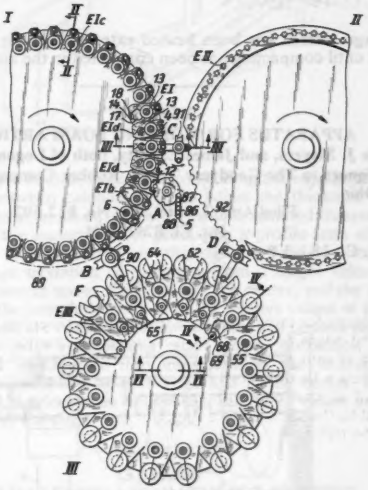
A method of picking poultry wherein birds suspended in flexible fashion from an overhead conveyor are conveyed through three different picking environments to completely defeather them. The initial picking stage includes a series of offset, counterrotating bullet-shaped supports having flexible fingers extending therefrom positioned on either side of the path. The two subsequent picking sections include (1) two overhead drum-type pickers having therebelow a pocket defined by upper and lower rows of bullet-shaped pickers which are offset with respect to one another; and (2) two horizontal drum-type pickers positioned to contact the wing and upper body portions of the bird having positioned thereabove a series of circular finger supports having fingers extending radially therefrom and rotatable about vertical axis to contact the legs of the birds. The latter two sections may be arranged in any order so long as they both follow the initial section described.

3,599,279
CLAMPING MECHANISM
David I. McDonald, Cincinnati, Ohio, assignor to The Cincinnati Milling Machine Co., Cincinnati, Ohio
Filed Mar. 20, 1970, Ser. No. 21,252
Int. Cl. B29f 1/00; B30b 1/10
U.S. Cl. 18—30 LT 10 Claims



A hydraulically actuated clamping mechanism for moving a movable member into and out-of-cooperative relationship with a stationary member. A pair of rigid link arms is pivotally interconnected at one end of each of the arms to form a toggle. The free end of one of the toggle arms is pivotally connected to a stationary portion while the free end of the other arm is pivotally connected to a movable member. The pivotally interconnected ends of the toggle arms define a knee-type joint which incorporates an integral hydraulic rotary actuator which upon the application of hydraulic pressure, causes relative motion between the arms and thereby moves the movable member into and out of cooperative relationship with the stationary member.

3,599,280
MACHINE FOR MAKING HOLLOW ARTICLES, ESPECIALLY BOTTLES, OF THERMOPLASTICS
Otto Rosenkranz, and Karl-Heinrich Seifert, both of Hamburg, Germany, assignors to Heindenreich & Harbeck, Wiesendamm, Germany
Filed Aug. 13, 1968, Ser. No. 752,302
Claims priority, application France, Jan. 16, 1968, 136,177
Int. Cl. B29d 23/03
U.S. Cl. 18—5 BM 28 Claims

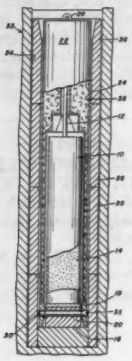


Hollow articles of thermoplastics, especially bottles, are made from tubular blanks by heating the ends thereof and press molding first their bottom and neck portion. Then the preformed blanks are heated around their center portion and are transferred into blow molds for inflating them to the final shape. The machine consists of a first rotary table with preheating and press molding means, a second rotary table with final heating means and a third rotary table with blow molds. The rotary tables are connected by transfer stations so that the blanks can be automatically transmitted and conveyed around all tables. The high production allows installation in prior sequence to filling plants.

3,599,281
HEAT INSULATING CASING
Charles Benjamin Boyer, Columbus, Ohio, assignor to Crucible Inc., Pittsburgh, Pa.
Filed Nov. 1, 1968, Ser. No. 772,681
Int. Cl. B22f 3/12
U.S. Cl. 18—5 H 10 Claims

This invention relates to the compacting of powdered-metal charges by fluid-pressure application in an autoclave, while said charge is at elevated temperature to eliminate the need for heating in the autoclave. In accordance with the in-

vention, heat dissipation from the charge is minimized by the use of a removable heat-insulating casing that covers the



charge after it has been heated externally of the autoclave and until compacting has been completed in the autoclave.

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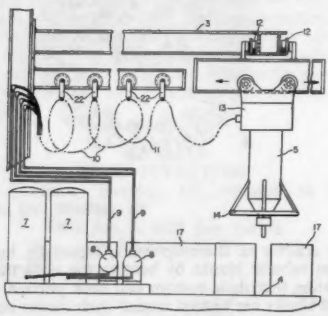
**3,599,282**

**APPARATUS FOR MOLDING FOAM ARTICLES**

**Dale J. Meyers, and James E. Ditty, both of Logan, Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio**

**Filed Apr. 2, 1969, Ser. No. 812,692**
**Int. Cl. B29c *3/04***
**U.S. Cl. 18—5 P** **3 Claims**



This disclosure relates to a molding apparatus having a mold support means with molds positioned thereon and means above the molds to permit a mixing head to move above the molds and having flexible connections to the foamable ingredient's supply system.

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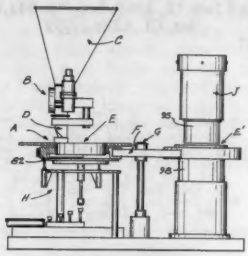
**3,599,283**

**MACHINE FOR USE IN THE MANUFACTURE OF GRINDING WHEELS**

**Robert E. Budai, and Philip McDowell, both of Downsview, Ontario, Canada, assignors to G & B Automated Equipment Limited, Downsview, Ontario, Canada**

**Filed May 5, 1969, Ser. No. 821,720**
**Int. Cl. B29d *31/00***
**U.S. Cl. 18—5 R** **6 Claims**

A machine with a worktable in which a mold cavity is formed. A hopper discharges grinding wheel mix into this cavity. The hopper has a complex rotational movement which serves to distribute the mix uniformly throughout the



mold cavity. The filled mold cavity is then transferred to a press.

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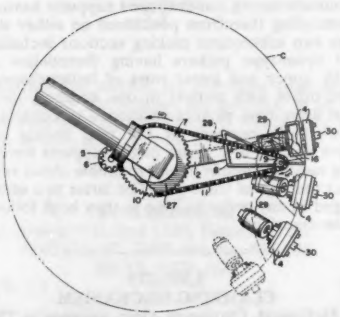
**3,599,284**

**DEVICE FOR CONTINUOUSLY MOLDING HOLLOW ARTICLES FROM THERMOPLASTIC MATERIAL**

**Yuko Osa, and Okitada Hara, both of Tokyo-to, Japan, assignors to Ishikawajima-Harima Jukogyo Kabushiki Kaisha, Yokyo-to, Japan**

**Filed Apr. 17, 1969, Ser. No. 817,086**
**Claims priority, application Japan, Apr. 19, 1968, 43/26298**
**Int. Cl. B29d *23/03***
**U.S. Cl. 18—5 BP** **3 Claims**



A device that is composed of a number of split dies for molding hollow articles disposed equiangularly along the circumference of a circle, a rotary guide which rotatingly moves keeping a certain relation to said split dies and sends to said split dies by turns thermoplastic material pushed out in the form of a pipe, and a pipe die means that blows air or the like into the pipe of thermoplastic material and pushes out the pipe which rotates in accordance with the moving of said rotary guide.

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**3,599,285**

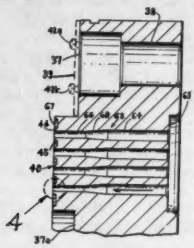
**PELLETIZING DIE PLATE**

**William F. Hamilton, Houston, Tex., assignor to Myron & Mallay d/b/a Mallay Tool Service, Houston, Tex.**

**Filed Oct. 10, 1968, Ser. No. 766,597**
**Int. Cl. B29f *1/022***
**U.S. Cl. 18—12 A** **7 Claims**

A pelletizing die plate and wherein a relatively small area of nozzle discharge end face metal around nozzle discharge openings is traversed by knives revolved to sever plastic pellets extruded through the nozzle bores. At the same time the knives traverse a substantially greater area of backing surface of harder, more brittle, carbide, ceramic or harder metal material over the discharge face around the softer metal an-

nuli around the extrusion bores. Thus the extrusion bores, formed through the relatively softer and more uniformly



workable metal, can be of uniformity to insure the extrusion of pellets of uniformity as they are cooled and cut off at the discharge ends of the aforesaid uniform extrusion bores.

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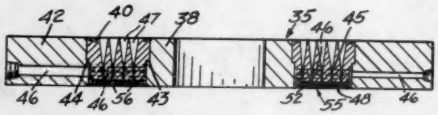
**3,599,286**
**THERMALLY INSULATED EXTRUSION DIE AND METHOD OF MAKING**
**James M. Karet, Worcester, Mass., assignor to Norton Company, Worcester, Mass.**
**Filed Nov. 12, 1968, Ser. No. 774,835**
**Int. Cl. B29f 3/04**
**U.S. Cl. 18—12 A** **13 Claims**



A heated die plate for a plastic pelletizer, construction and method for applying alternate layers of metal and ceramic thermal insulating material that fills the space between a plurality of extrusion nozzles, the final layer of ceramic material being sealed against penetration by cooling fluids and also having uniform wear resistant qualities to reduce uneven abrasion of the cutting face and of the cooperating cutting edge of a rotary knife passing over the cutting face.

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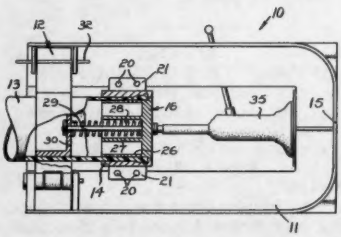
**3,599,287**
**END-FORMING TOOL FOR THERMOPLASTIC TUBING**
**Basil Alfred Buck, Broken Hill, New South Wales, Australia, assignor to Broken Hill South Limited, Melbourne, State of Victoria, Australia**
**Filed July 9, 1968, Ser. No. 743,349**
**Claims priority, application Australia, July 10, 1967, 24296/67**
**Int. Cl. B29c 17/02**
**U.S. Cl. 18—19 TE** **1 Claim**



A tool, and also a method, for forming a ring on the end of thermoplastic tubing, wherein the tool is provided with a clamp to clamp the tubing near one end and a mold formed from two half molds to clamp over the end, the half molds having an inner annular recess, and a die having a skirt to support the end of the tube against inward collapse, the die and mold being heated to render the tubing plastic, and the die and mold then being urged towards the clamp to force plastic flow of the tubing into the recess in the mold.

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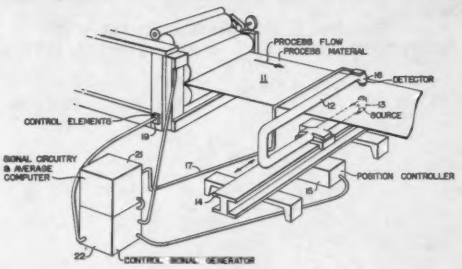
**3,599,288**
**SCAN AVERAGE MEMORY CONTROL SYSTEM**
**Stephen L. Eakman, Framingham, Mass., assignor to Laboratory for Electronics, Inc., Waltham, Mass.**
**Filed Jan. 23, 1969, Ser. No. 793,341**
**Int. Cl. B29d 7/14**
**U.S. Cl. 18—2 HA** **2 Claims**




A process control system for controlling the adjustments in spacing between calender rolls to adjust the thickness of a process material sheet. A sensing head is scanned transversely across the material sheet producing a profile scan of the thickness of the material and this signal is used to compute the average deviation of thickness from a target value for three transverse zones, the left edge, the center, and the right edge. At the completion of a scan the relative values of these three signals are compared to one another and control signals for both edge corrections and crown correction are developed which take into consideration the interaction between adjustments at each edge and in the center. Each correction is undertaken only with a full set of values across the width of the strip.

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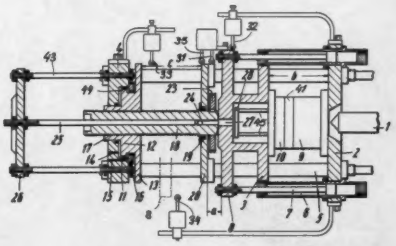
**3,599,289**
**MOLD-CLOSING APPARATUS FOR MOLDING MACHINE**
**Umberto Girola, Via Monte Ceneri 60, Milan, Italy**
**Filed Oct. 1, 1969, Ser. No. 862,876**
**Claims priority, application Germany, Oct. 2, 1968, P 18 01 394.0**
**Int. Cl. B29f 1/00**
**U.S. Cl. 18—30 LA** **14 Claims**



A fixed mold-supporting plate and a fixed backstop plate, spacedly mounted on the bed of a molding machine, are interconnected by tie bars on which a movable mold-supporting plate and a holding plate are slidably mounted, with the

holding plate disposed between the backstop and movable mold-supporting plates. The backstop plate forms a fluid chamber receiving a piston which also rides the tie bars and is axially slidable thereon, relatively to the backstop plate, over a distance of a few millimeters. As the complementary mold portions on the two mold-supporting plates are being brought together by hydraulic or pneumatic displacement of the movable mold-supporting plate, a drive motor on the holding plate rotates a screw extending axially therethrough or a nut carried on that screw to provide a brace substantially spanning the gap between the mold and the backstop plate whereupon pressure in the fluid chamber of the latter plate generates a supplemental thrust to hold the mold closed.

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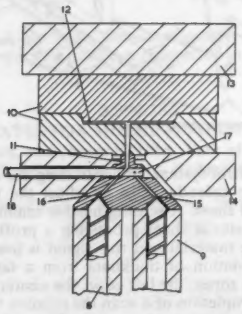
**3,599,290**
**INJECTION MOLDING MACHINES**

**Paul Johnson Garner, Welwyn Garden City, England, assignor to Imperial Chemical Industries Limited, London, England**

**Filed Dec. 6, 1968, Ser. No. 781,763**
**Claims priority, application Great Britain, Dec. 15, 1967, 57081/67**
**Int. Cl. A43d *3/00*; B28b *1/24***
**U.S. Cl. 18—30 AA** **11 Claims**



There is provided a method and apparatus for molding laminar articles. Two screw-injection barrels sequentially pass resinous materials through a valve in a single sprue into a mold cavity. The valve is controlled so that material from one screw-injection barrel does not pass while material flows from the other screw-injection barrel. The control means is synchronized so that the desired quantities of materials from the two injection barrels are placed in the mold cavity.

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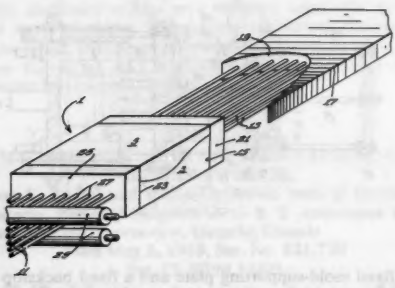
**3,599,291**
**FILAMENT LAMELLAE FORMING APPARATUS**

**John A. Alexander, Painesville, Ohio, assignor to TRW Inc., Cleveland, Ohio**

**Filed Oct. 27, 1969, Ser. No. 869,624**
**Int. Cl. B29f *1/022***
**U.S. Cl. 18—30 WM** **5 Claims**



Filament-reinforced lamellae for fabricating composite turbine blades are made by feeding filaments into matched grooves formed in the faces of a split die having a contour corresponding exactly to that of the desired lamella form. The distance to which the individual reinforcing filaments are inserted into the die block is determined by wire stop elements inserted from the opposite end. After the reinforcing filaments are properly placed the stop wires are removed and molten or liquid resin is injected between the die faces to bind the filaments together into a ply. The die is then heated to cure or chilled to solidify the resin or binder, the filaments are sheared and the ply lamella is ejected from the mold.

A machine feeds the reinforcing filaments into the grooves between the die faces after the wire stops have been positioned from the opposite end. The machine removes the wire stops and injects the molten or liquid resin or binder, solidifies the resin or binder in the closed mold, shears the filaments after solidification and ejects the lamella from the mold.

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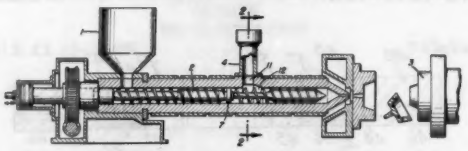
**3,599,292**
**EQUIPMENT FOR THE INJECTION MOLDING OF THERMOPLASTIC MATERIALS HAVING A HIGH CONTENT OF VOLATILE SUBSTANCES**

**Isidoro Ronzoni, Camerlata, and Mario Miani, Rho, both of, Italy, assignors to Montecatini Edison S.p.A.**

**Filed July 10, 1968, Ser. No. 743,794**
**Claims priority, application Italy, July 17, 1967, 18,475**
**Int. Cl. B29f *1/00***
**U.S. Cl. 18—30 SM** **2 Claims**



Equipment is provided for the injection molding of thermoplastic materials containing high quantities of volatile substances which is of the type having a degassing zone constituted by the reduction at some point along the diameter of the core of the pressing screw, in registration with a vent hole adjacent the cylinder in which said screw moves. The particular improvement here involved is characterized by the provision, in combination with said degassing zone and preferably at a location immediately on the inlet side of the degassing zone itself, of a device shaped like a spinneret constituted by at least a plate provided with holes connected with the screw shaft and suitable for causing a high pressure on the thermoplastic material on the inlet side of said degassing zone and for increasing the surface of the thermoplastic material being subjected to said degassing. In addition, at least one part of the length of the cylinder containing said pressing screw is provided with a wide countersink or ovalization suitable for facilitating the advancing of the thermoplastic material through the equipment. Moreover, the said cylinder, starting from an end adjacent said vent-hole, is provided with a flared zone suitable to further facilitate the injection-molding operation.

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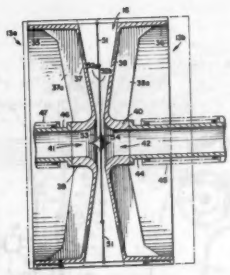
**3,599,293**
**APPARATUS FOR FORMING FLUFF**

**Ernst Daniel Nystrand, and Thomas E. Broeren, both of Green Bay, Wis., assignors to Paper Converting Machine Company Inc., Green bay, Wis.**

**Filed July 16, 1969, Ser. No. 842,146**
**Int. Cl. D01g *25/00***
**U.S. Cl. 19—155** **8 Claims**

A machine for forming articles of fluffed cellulosic material includes a drum having first and second sections mounted coaxially for rotation and spaced apart to provide a chamber through which the fluff moves radially. An air-pervious web travels with the drum sections and covers the periphery of the chamber for receiving shredded cellulosic material which

enters each of the drum sections axially and is forced against opposite sides of a baffle plate mounted between and rotating with the drum sections. The baffle plate is in the general shape of oppositely extending cones, the apexes of which divert the inflow of shredded material radially outward. A



plurality of sets of tabs spaced about the baffle plate with each set at a different radial distance cause an even distribution of the fluff material against the travelling web. The drum sections are adapted for adjustable spacing; and the machine thus has the capacity of making articles of substantially larger width than heretofore has been feasible.

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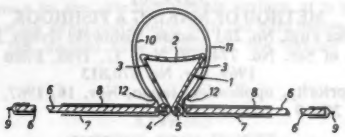
**3,599,294**

## LOOSELEAF BINDERS

**Michael John Anthony Lawes, 11, Jew St., Brighton, Sussex, England**

**Filed Sept. 8, 1969, Ser. No. 856,076**
**Claims priority, application Great Britain, Sept. 24, 1968, 45393/68**
**Int. Cl. B42f** *1/00*
**U.S. Cl. 24—67.7** **7 Claims**



A looseleaf binder in which a pair of clamping elements are biassed towards each other by one or more curved springs, in a manner permitting sheets of paper to be gripped between said clamping elements, has a first pocket of synthetic plastics material housing one of the clamping elements, and a second pocket of synthetic plastics material housing the other one of the clamping elements, said first pocket being integral with, or forming part of, a front cover of synthetic plastics material, said second pocket being integral with, or forming part of, a rear cover of synthetic plastics material.

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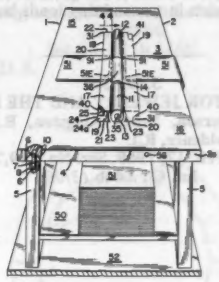
**3,599,295**

## ATTACHABLY ADAPTED CLAMP AND WRITING PLATFORM THEREFOR

**Thomas P. O'Donnell, 220 Highland Blvd., Brooklyn, N.Y.**

**Continuation-in-part of application Ser. No. 472,950, July 19, 1965, now Patent No. 3,423,798, dated Jan. 28, 1969. This application June 3, 1968, Ser. No. 733,855**
**Int. Cl. B42f** *1/00*
**U.S. Cl. 24—67.7** **11 Claims**

A paper supporting clamp 17 best shown in FIG. 2 is hingedly mounted on a flat paper receiving surface 3 by knuckle portions 61, 62 and 72. The clamp has an arcuate centrally recessed portion 65 adapted to receive a curled over edge of a sheet of paper. Free edge 66 of the clamp is undercut at 68



to provide a finger engageable end portion to facilitate opening of the clamp to release paper engaged thereby. Indented finger engageable portions 40 and 44 are provided and an opening to facilitate viewing of clamped paper is provided.

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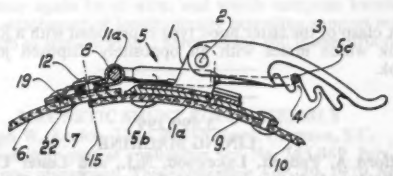
**3,599,296**

## BUCKLE FOR SKI AND MOUNTAINEERING SHOES

**Loris Baso, Corso Milano 19, Padua, Italy**

**Filed July 9, 1969, Ser. No. 840,357**
**Claims priority, application Italy, July 25, 1968, 19426A/68**
**Int. Cl. A43c** *11/14*
**U.S. Cl. 24—70 SK** **7 Claims**



A buckle for ski and/or mountaineering shoes wherein the clamping loop is releasably secured to a mounting plate fixedly secured to the shoe by a screw.

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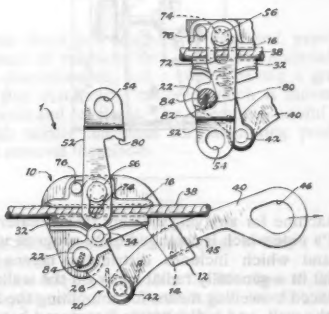
**3,599,297**

## WIRE GRIP

**Henry T. Sievers, Jamestown, N.Y., assignor to Crescent Niagara Corporation, Jamestown, N.Y.**

**Filed June 18, 1970, Ser. No. 47,435**
**Int. Cl. F16g** *11/09, 11/12*
**U.S. Cl. 24—132 WS** **7 Claims**



A wire grip including a novel safety latch device by which the grip is manually applied to and removed from a wire to

be stretched; the device automatically serving to provide a temporary lock to retain the grip on the wire as the grip is applied thereto. Upon manipulation of the grip to position the jaws thereof in gripping engagement with the wire, the device is manually movable into a permanent locking position, wherein it assists in transmitting loads between the wire clamping jaws.

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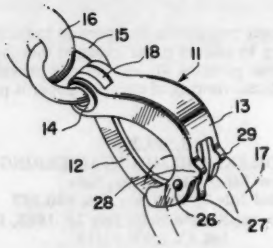
**3,599,298**
**CLASP FOR JEWELRY AND THE LIKE**
**Olof Verner Anderson, North Kingston, R.I., assignor to Anson Inc., Providence, R.I.**
**Filed Feb. 17, 1969, Ser. No. 799,787**
**Int. Cl. A44b *13/00***
**U.S. Cl. 24—232** **1 Claim**




A clasp of the sister hook type is provided with a journaled hook which mates with an oppositely disposed journaled hook.

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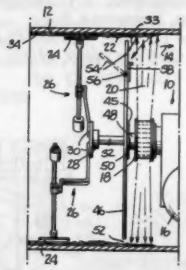
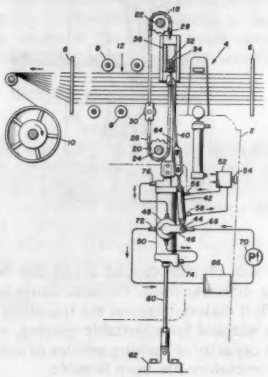
**3,599,299**
**LINING MACHINE**
**Clifford A. Padgett, Lakewood, N.J., and Lester C. Slade, Escalon, Calif., assignors to Raymond International, Inc., New York, N.Y.**
**Filed Dec. 12, 1968, Ser. No. 783,301**
**Int. Cl. B28b *21/24***
**U.S. Cl. 25—38** **4 Claims**




A machine for applying a fluent lining material to the inside of a pipe which is arranged to be progressed through the pipe and which includes distributor means for slinging material in a generally radial spray on the walls of the pipe, and spaced trowelling means for smoothing the lining material on the wall, and a diaphragm interposed between the distributor means and the trowelling means for intercepting rebound particles and preventing them from imbedding in the freshly trowelled surface.

**3,599,300**
**FLUID PRESSURE AUTOMATIC TENSIONER**
**Robert W. Timble, Pensacola, Fla., assignor to Monsanto Company, St. Louis, Mo.**
**Filed Feb. 11, 1970, Ser. No. 10,566**
**Int. Cl. D02h *13/26***
**U.S. Cl. 28—35** **9 Claims**



A tensioner, for controlling tension in winding and spooling operations of continuous strands, yarns, tows, sheets and the like, having oppositely displaceable, cooperating rolls, one of which is adapted to feel or sense tension variations in a material normally passing between the rolls and to position a fluid pressure means for applying a compensatory lesser or greater amount of tension to the material.

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**3,599,301**
**METHOD OF MAKING A FISHHOOK**
**Shigekatsu Fujii, No. 281 Gamae, Nishiwaki Hyogo, Japan**
**Division of Ser. No. 774,678, Nov. 12, 1968. Filed Sept. 24, 1969, Ser. No. 870,813**
**Claims priority, application Japan, Nov. 16, 1967, 42/73765**
**U.S. Cl. 29—9** **1 Claim**

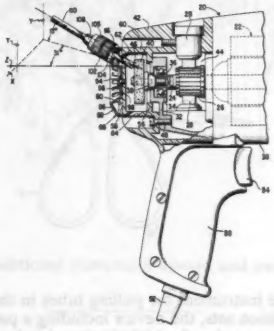
A method of making a fishhook including the steps of stamping a paddle-shaped block from a planar section of sheet material while leaving one end of the block connected to the sheet material, forming a gap in the sheet material about the part of the block spaced from its connected end, forming a tapered portion adjacent a pointed end in the free end of the block and then bending the free end arcuately so that the block has a J-shaped configuration and then separating the block from the sheet material.

3,599,302

## INTEGRAL BIT SHARPENER FOR POWER TOOLS

Edmund C. Dudek, St. Charles, Ill., assignor to The Singer Company, New York, N.Y.

Filed Nov. 18, 1968, Ser. No. 776,556
Int. Cl. B23b 45/02
U.S. Cl. 29—26 2 Claims



This disclosure relates to a power tool having an integral bit or implement sharpener which permits a bit to be sharpened by the power tool whenever the need arises. One example of this would be a portable power drill in which the drill or implement is normally driven by the electric motor mounted in the housing. A grinding wheel is connected at the opposite end of the motor so that whenever the bit needs sharpening it is simply removed from its driven connection or chuck and placed in a support assembly for manual turning in contact with the grinding wheel. Also, cam means are provided on the support assembly whereby the proper rake angle for the cutting edge being sharpened will be maintained. The support assembly provides for aligning for the axis of the drill with respect to the grinding wheels surface at a predetermined surface angle and coacts with the cam means so as to produce the desired rake angle for the cutting edge in question.

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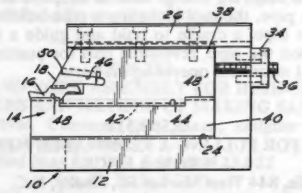
3,599,303

## CUTTING TOOL INSERT

Terry L. Sletten, Westland, Mich., assignor to The Valeron Corporation

Filed Jan. 21, 1969, Ser. No. 792,403
Int. Cl. B26d 1/00
U.S. Cl. 29—95 14 Claims



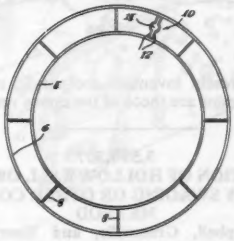
A cutting tool insert formed from a cylindrical blank to include a cutting edge in an axial plane across at least one end thereof and having a chip control relief therebehind and extending relatively below the cutting edge plane to provide side clearance.

3,599,304

## DANDY AND WATERMARK ROLLS

Kenneth Senior, Frinton on sea, England, assignor to W. Green Son & Waite Limited, Kent, England

Filed Dec. 1, 1967, Ser. No. 687,213
Claims priority, application Great Britain, Dec. 5, 1966, 54,390/66
Int. Cl. B21b 27/02
U.S. Cl. 29—121 R 7 Claims



The specification deals with the construction of the supporting rings in the frame structures of dandy rolls and watermark rolls and discloses how such rings can be built up from elongate material formed to shape in place of conventional stamped plate members. In a preferred arrangement, two lengths of wire are formed into inner and outer circles which are connected concentrically by intermediate members, which may again be of wire, and which comprise locations for the attachment of longitudinally extending support members, such as spirally wound wires, of the roll frame structure.

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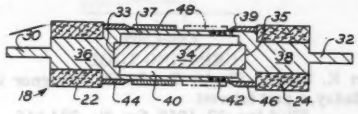
3,599,305

## MAGNETIC SHUNT ROLL ASSEMBLY

Christoph W. Aurich, 224 Camelot Road, Clemson, S.C.

Continuation-in-part of application Ser. No. 743,869, July 10, 1968, now abandoned. This application Apr. 29, 1970, Ser. No. 32,814
Int. Cl. B21b 31/08
U.S. Cl. 29—129.5 11 Claims



A magnetic shunt roll assembly is disclosed, providing a shunting circuit of magnetic flux conducting material which is normally discontinuous, and a switch having a graspable element of flux conducting material which is moveable to close the circuit and reopen it. The assembly is useful in conjunction with textile machines for facilitating positioning thereon and removal therefrom.

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3,599,306

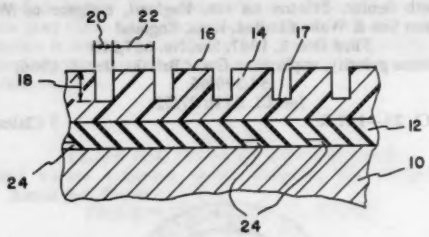
## ROLL COMPOSITION

Donald A. Brafford, Beloit, Wis., assignor to Beloit Corporation, Beloit, Wis.

Continuation-in-part of Ser. No. 784,606, Dec. 18, 1968. This application June 13, 1969, Ser. No. 832,918
Int. Cl. B21b 31/08
U.S. Cl. 29—132 5 Claims

A roll for use in a nip defining relationship with another roll, including an inner core, an elastomeric layer around the

inner core and an outer shell wrapping core consisting of a nonwoven mat bonded with a thermosetting resin. Preferred




mats for the present invention are acrylic nonwoven mats, and preferred resins are those of the epoxy resin family.

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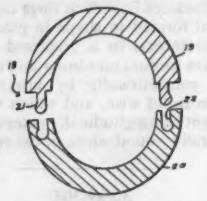
**3,599,307**
**PRODUCTION OF HOLLOW BALL OR ROLLER BEARING BY SWAGING OR OTHER COMPRESSIVE METHOD**

**Gabe L. Campbell, Greenville, and Henry A. Johnson, Dayton, both of, Ohio, assignors to The United States of America as represented by the Secretary of the Air Force**

**Filed Aug. 5, 1969, Ser. No. 847,653**
**Int. Cl. B23p** *11/00;* **B21h** *1/14;* **F16c** *33/32, 33/34*
**U.S. Cl. 29—148.4 A** **6 Claims**




A unique hollow type of ball or roller bearing, fabricated from a pair of half-shell members having a matching male and female type of mechanical joint-reinforcing means extending therebetween, is initially joined along a well-defined joint area, and is thereafter swaged or otherwise compressed into a smaller-and-smaller diameter until a substantial migration of metal is interchanged between, and thereby eliminates the previously well-defined joint area to thus provide a more stable and stronger union.

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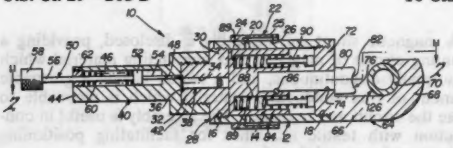
**3,599,308**
**CRIMPING TOOL**

**Robert K. Fielder, Flagler Beach, Fla., assignor to Earl L. Halladay, a part interest**

**Filed Jan. 27, 1969, Ser. No. 794,155**
**Int. Cl. H01r** *43/04;* **B23p** *19/04;* **B21i** *15/24*
**U.S. Cl. 29—203 D** **10 Claims**

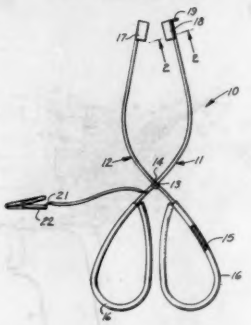



A tool for crimping tubular or sleevelike connectors onto electrical conductors and comprising relatively fixed die means adapted to operatively support a connector during a crimping operation, first and second relatively movable die means adapted to independently cooperate with the fixed die means to crimp a connector therebetween, explosive means for moving the relatively movable die means from deactuated to actuated positions, means for detonating the explosive means, and means for biasing the relatively movable die means toward their respective deactuated positions.

**3,599,309**
**VACUUM TUBE PULLING TOOL**

**Randy Lee Mulligan, 607 W. Grant Box #5, Onaraga, Ill.**

**Filed Oct. 17, 1969, Ser. No. 867,266**
**Int. Cl. B25b** *7/00, 27/02*
**U.S. Cl. 29—203 H** **4 Claims**




A tonglike instrument for pulling tubes in the high-voltage box of television sets, the device including a pair of pivotable arm members each of which has a circular gripping end which when closed together will encompass and grip the tube easily from its socket without the user coming into contact with the high voltage, one of the gripping ends having a discharge prong, and the instrument including an alligator clip for electrically engaging a television set chassis.

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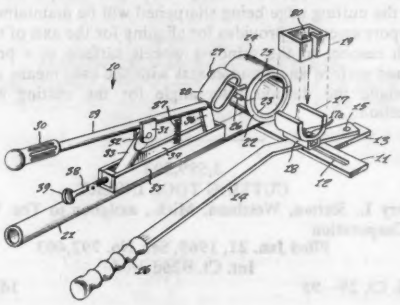
**3,599,310**
**PIPEFITTING SECURING TOOL**

**Wilbur H. Brownlee, Route #1, Box 19, Claysville, Pa.**

**Filed Jan. 22, 1968, Ser. No. 699,527**
**Int. Cl. B23p** *19/04*
**U.S. Cl. 29—237** **1 Claim**




A tool for applying fittings such as adapters and elbows to soft plastic pipe, the tool including a pipe-holding clamp for holding the pipe, a cradle to hold and guide a fitting to be secured upon the pipe, reversible part for pushing he fitting and manual means for operating the parts.

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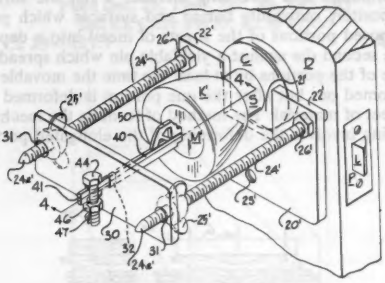
**3,599,311**
**DEVICE FOR PULLING A REMOVABLE MECHANISM FROM A LOCK**

**John B. Ellis, 844 West Marion St., Shelby, N.C.**

**Filed Mar. 6, 1969, Ser. No. 804,904**
**Int. Cl. B23p** *19/04*
**U.S. Cl. 29—259** **5 Claims**

A device for pulling a removable key-operated mechanism from a lock including a support plate adapted to straddle the key-operated mechanism of the lock and engage a non-removable, door-mounted portion of the lock, a key-operated mechanism pulling means disposed in spaced apart parallel relation to the support plate and adapted to engage

the key-operated mechanism, and means connecting the support plate and pulling means and mounting said pulling means for translational movement toward and away from the support plate.



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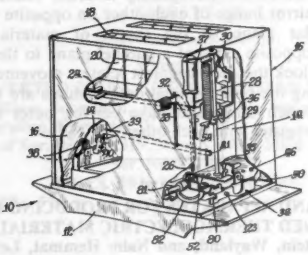
3,599,312

## TOASTER TIMER HAVING EXTERNAL ADJUSTMENT

Franklin C. Hitzeroth, Centerville, Iowa, assignor to McGraw-Edison Company, Elgin, Ill.

Filed Mar. 10, 1970, Ser. No. 18,256
Int. Cl. A47j *37/08*
U.S. Cl. 99—329 9 Claims



A bimetal timing mechanism having first and second externally actuated adjustment means that change the orientation of the bimetal relative to the release latch means effective thereby, respectively, to factory calibrate the mechanism to its particular use, such as in a toaster for timing the toasting cycle, and to accurately vary this factory-set cycle control for individually satisfying he user's preferences.

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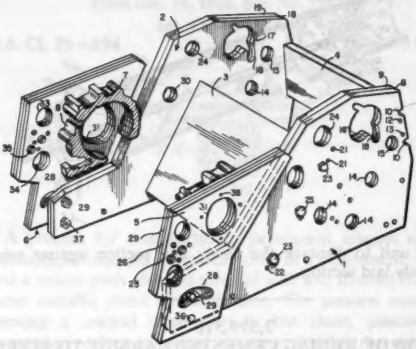
3,599,313

## FRAME AND YOKE ASSEMBLY FOR HIGH-SPEED PRINTERS AND METHOD OF MAKING SAME

Melvin L. Litvin, Chestnut Hill, Mass., assignor to Data Printer Corp., Boston, Mass.

Filed May 8, 1969, Ser. No. 823,022
Int. Cl. B23q *17/00*
U.S. Cl. 29—407 7 Claims

A method of making the frame and yoke of a high-speed printer, comprising stamping out a number of identical pieces, each conforming in shape to the side frames or the yoke frames of the printer to be completed but of thinner material, in which locating holes for the working parts of the printer are stamped in the same operation; bonding sets of the stamped parts together to form main frames and yoke frames of the desired final thickness, boring or grinding the holes that must be precisely located in a jig to desired final dimensions, and mounting the bonded frames together by framing members located with dowels installed in the holes provided in the side frames and precision bored as described.



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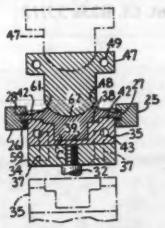
3,599,314

## METHOD FOR MAKING FORGINGS

George Harrison, Berwyn, and Nelson K. Harrison, Riverside, both of, Ill., assignors to North American Rockwell Corporation, Pittsburgh, Pa.

Division of Ser. No. 584,695, Oct. 6, 1966, Pat. No. 3,445,904.
Filed Jan. 13, 1969, Ser. No. 801,908
Int. Cl. B23p *17/00*; B23k *19/00*
U.S. Cl. 29—418 6 Claims



A method of casting and forging metal pieces in which the casting metal is caused to engage a support adjacent to the casting mold and, following casting, the cast piece is separated from the mold and carried by the support to a forging station for the forging operation and is thereafter carried by the support to the trimming station where the forged part is separated from the trim part.

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3,599,315

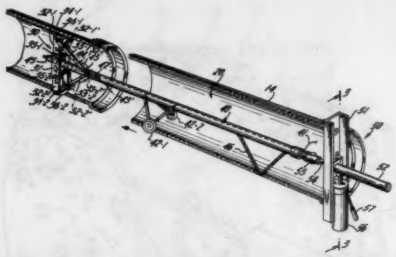
## METHOD FOR EMPLOYING NEW PIPE ALONG PREVIOUSLY LAID PIPE

Remo R. Pizzagalli, Shelburne, Vt., assignor to Atlas Pipe Popper Corporation, Farmingdale, Long Island, N.Y.

Division of Ser. No. 584,196, Oct. 4, 1966, Pat. No. 3,469,298.
Filed Mar. 10, 1969, Ser. No. 812,542
Int. Cl. B23p *19/00*, *19/04*
U.S. Cl. 29—431 2 Claims

A method of emplacing a newly laid section of pipe with respect to a previously laid section of pipe by positioning a

support member within both said sections, coupling a hydraulic jacking unit to said support, and operating said



jacking unit to displace the newly laid section against said previously laid section.

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3,599,316

**METHOD OF JOINING CEMENTED CARBIDE TO STEEL**

Max D. Moskal, La Grange, Ill., assignor to Continental Can Company, Inc., New York, N.Y.

Continuation-in-part of application Ser. No. 699,038, Jan. 19, 1968, now abandoned. This application Dec. 15, 1969, Ser. No. 885,286

Int. Cl. B23k *31/02*

U.S. Cl. 29—473.1 8 Claims

A method of making composite articles of cemented tungsten carbide and steel wherein the tungsten carbide is bonded to a steel which, during cooling, undergoes a martensitic transformation whereby the net contraction of the steel is about equal to the contraction of the carbide.

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3,599,317

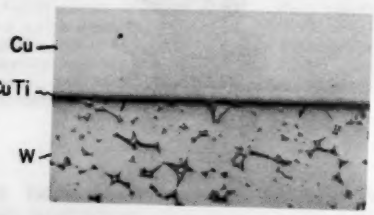
**METHOD OF METALS JOINING**

David L. Purdy, and John F. Williams, both of Indiana, Pa., assignors to Nuclear Materials and Equipment Corporation, Apollo, Pa.

Filed Mar. 21, 1967, Ser. No. 624,916

Int. Cl. B23k *35/12*

U.S. Cl. 29—501 2 Claims




The method of joining members of copper and tungsten and members of copper and corrosion- and/or temperature-resistant nickel-base alloys in the practice of which a mass of titanium is interposed between the members and the joint is heated to produce a eutectic of copper and titanium and then permitted to solidify.

The like method for joining members of niobium and aluminum oxide in which a mass of nickel and titanium or of titanium alone are interposed between the members.

Brazed assemblies produced by the methods.

A high-temperature-resistant vacuum seal of niobium and aluminum oxide.

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3,599,318

**METHOD OF BONDING SHEETS**

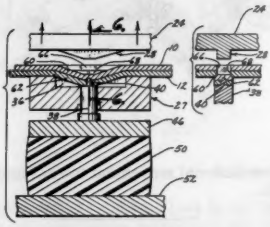
Walter D. Behlen, Columbus, Nebr., assignor to Behlen Manufacturing Company, Inc., Columbus, Nebr.

Continuation of application Ser. No. 629,505, Apr. 10, 1967, now abandoned. This application Feb. 2, 1970, Ser. No. 7,367

Int. Cl. B21d *39/00*; B23p *11/00*

U.S. Cl. 29—509 1 Claim

A mechanical splice for rolls of metal in continuous metal fabrication wherein each splice includes a portion deformed from adjacent sheets of metal thereby limiting relative movement therebetween. In one embodiment, the portion of material deformed is spread after it is deformed to prevent it from returning to its original condition. A die for performing the deformation and spreading includes a flat die surface with oppositely outwardly flaring end surfaces which press superimposed portions of the sheets of metal into a depression in a second die against a yieldable pin which spreads at least one of the portions by at least the time the movable die has bottomed out but after the one portion is deformed out of its sheet of material. The method of forming the mechanical splicing involves the deforming of the elongated portion



thereby forming an opening in the sheet of material and then the spreading of the deformed portion such that it cannot pass back into the opening. The spreading may begin at the same time as the deforming step begins but is not completed until the deforming step has been completely finished. A second embodiment of the splicing includes semielliptical portions the mirror image of each other on opposite sides of a perpendicular plane to the sheets of material being deformed on opposite sides of a parallel plane to the sheets of material to lock the sheets against relative movement. The dies for forming the semielliptical deformations are the mirror image of each other and have convex outer surfaces whereby they register with each other.

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3,599,319

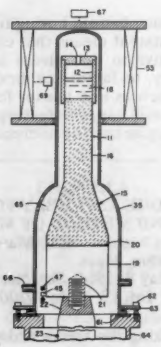
**METHOD AND APPARATUS FOR PRODUCING FINE-GRAINED THERMOELECTRIC MATERIAL**

Martin Weinstein, Wayland, and Naim Hemmat, Lexington, both of, Mass.

Filed Mar. 15, 1968, Ser. No. 715,124

Int. Cl. B23p *17/00*

U.S. Cl. 29—527.6 5 Claims

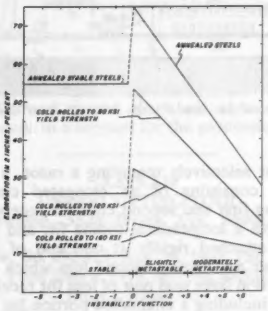


System having a carbon ultrasonic transmission line and crucible for obtaining the desired metallurgical effects upon a liquid and a solidifying melt to produce high-purity, high-temperature, fine-grained thermoelectric material wherein abrupt nucleation takes place while the entire melt is constantly being stirred to provide an invariant liquid composition during solidification.

## 3,599,320
## METASTABLE AUSTENITIC STAINLESS STEEL

Kenneth G. Brickner, Wilkinsburg Borough, and David C. Ludwigson, Hempfield Township, Westmoreland County, both of, Pa., assignors to United States Steel Corporation

Filed Dec. 26, 1967, Ser. No. 693,205
Int. Cl. C22c *39/20*; B23p *17/00*
U.S. Cl. 29—527.7 4 Claims



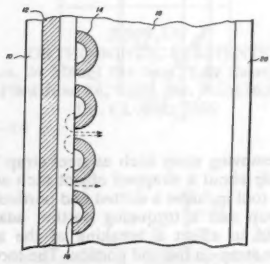

A metastable austenitic stainless steel containing 0.07 to 0.18 percent carbon, 0.9 to 6.2 percent manganese, 4.1 to 7.7 percent nickel, 14.1 to 17.9 percent chromium and 0.01 to 0.14 percent nitrogen, the balance essentially iron. The steel has an Instability Function (IF) of 0.0 to 2.9 as determined by the following equation:

$$IF = +37.193 - 51.248\,(\%\ C) - 1.0174\,(\%\ Mn) - 2.5884\,(\%\ Ni) - 0.46770\,(\%\ Cr) - 34.396\,(\%\ N).$$

## 3,599,321
## INVERTED SPACE CHARGE LIMITED TRIODE

Fred William Schmidlin, Pittsford, N.Y., assignor to Xerox Corporation, Rochester, N.Y.

Division of Ser. No. 620,319, Mar. 3, 1967. Filed Aug. 13, 1969, Ser. No. 871/007
Int. Cl. B01j *17/00*; H01l *7/00*
U.S. Cl. 29—576 4 Claims

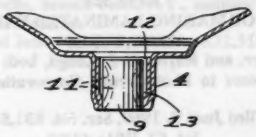


This disclosure is directed toward a method of fabricating an inverted space charge limited solid-state triode and to the device resulting therefrom. The method, in general, comprises depositing a continuous film of conductive metal to act as a gate, oxidizing the exposed side of the gate metal to form an insulating layer, depositing a semiconductive layer on the top of the insulated gate, depositing a pinhole cathode grid on the semiconductor, oxidizing the exposed side of the cathode grid to form an insulating coating, depositing more semiconductor over the cathode insulation and depositing a continuous film of conductive metal over the semiconductor to act as a collector.

## 3,599,322
## SPEAKER MAGNET ASSEMBLY

Rollin J. Parker, Greenville, Mich., assignor to General Electric Company

Division of Ser. No. 515,322, Dec. 21, 1965, Pat. No. 3,466,495.
Filed Dec. 16, 1968, Ser. No. 798,544
Int. Cl. H04r *7/04*
U.S. Cl. 29—594 3 Claims

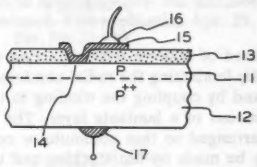



A process for manufacturing permanent magnet speaker assemblies consisting essentially only of a permanent magnet and a return path element integral with and formed from the same metallic sheet as the basket. The process comprises forming a central depression in the sheet, piercing the depression to form a central aperture, shaping the remaining depressed portion into a return path element and the remaining portion of the sheet into a basket and fitting a permanent magnet within the return path element.

## 3,599,323
## HOT CARRIER DIODE HAVING LOW TURN-ON VOLTAGE

Arjun N. Saxena, Williamstown, Mass., assignor to Sprague Electric Company, North Adams, Mass.

Filed Nov. 25, 1968, Ser. No. 778,533
Int. Cl. B01j *17/00*; H01l *7/24*
U.S. Cl. 29—590 2 Claims




A hot carrier diode is provided by depositing vaporized chromium onto a prepared P-type silicon surface. Current flow is by the Schottky emission of hot holes from silicon over the relatively low barrier at the chromium-silicon interface resulting in a device with a characteristically low turn-on voltage.

## 3,599,324
## METHOD FOR WINDING STATOR COILS

Robert W. Peters, Menomone Falls, Wis., assignor to Lincoln Tool & Manufacturing Co.

Division of Ser. No. 662,597, Aug. 23, 1967, Pat. No. 3,484,923.
Filed July 17, 1969, Ser. No. 861,523
Int. Cl. H02k *15/00*
U.S. Cl. 29—596 2 Claims

A stator winding machine attachment which is adapted to be mounted on a stator prior to winding and includes a pair of semicircular members hingedly connected together for

movement from an open to a closed position. A number of tabs are equally spaced around the interior edge of each of the members in corresponding relation to the distance between the slots in the stator. The attachment includes a locator ear which projects inwardly from the interior edge of one of the members to positively locate the attachment relative to the stator.

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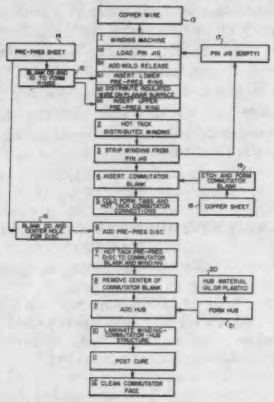
**3,599,325**

## METHOD OF MAKING LAMINATED WIRE WOUND ARMATURES

**Robert P. Burr, and Raymond J. Keogh, both of Huntington, N.Y., assignors to Photocircuits Corporation, Glen Cove, N.Y.**

**Filed June 9, 1969, Ser. No. 831,556**
**Int. Cl. H01r** *43/00*
**U.S. Cl. 29—597** **9 Claims**




A method of making self-supporting wire-wound disc armatures by laminating the radial conductor portion of the armature and by coupling the winding to the commutator and hub by means of a laminate layer. The sequence of operations is arranged so that commutator connections can conveniently be made by hot stacking and the commutator can be formed from a thin sheet metal blank.

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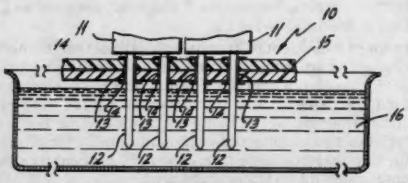
**3,599,326**

## METHOD OF FORMING ELECTRICAL CONNECTIONS WITH SOLDER RESISTANT SURFACES

**Simon DiRenzo, Philadelphia, Pa., assignor to Philco-Ford Corporation, Philadelphia, Pa.**

**Filed Jan. 27, 1969, Ser. No. 794,090**
**Int. Cl. H05k** *3/30*
**U.S. Cl. 29—626** **5 Claims**



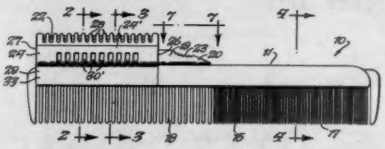

A method of manufacturing printed circuit boards of the type having a plurality of contact pins projecting from one side thereof and adapted for use as wire wrap terminals connecting board-carried wiring to external circuits. The method includes selectively coating portions of the pins spaced from the board with a material to which solder will not adhere to maintain such portions free of solder, and in condition for making wire-wrap connections, followed by immersing the pins and adjacent board regions in molten solder to connect the pins to circuits carried by the board.

**3,599,327**

## RAZOR AND COMB HOLDER

**Sam S. Calandra, 141 Greenfield Drive, Tonawanda, N.Y.**

**Filed May 12, 1969, Ser. No. 823,923**
**Int. Cl. B26b** *21/12*
**U.S. Cl. 30—30** **9 Claims**




A holder for selectively mounting a razor, a razor-guard, and a comb consisting of an elongated channel-shaped member having first and second ends for receiving the back of a comb with a longitudinal sliding fit, and an U-shaped razor holder attached rigidly at one end of the channel-shaped member and having second legs which extend in an opposite direction from said pair of legs for receiving a blade, a razor guard including a channeled portion for mounting on the razor holder with a longitudinal sliding fit and including a guard portion which can lie on either side of a razor mounted in the holder to permit the razor to be used for thinning or shaving while the guard is mounted thereon by either a right-handed or a left-handed person by merely reversing the guard on the holder, and a third channel-shaped member secured to the guard for also attaching the guard to the back of the comb when said guard is in position on said holder to thereby stabilize said razor and said comb relative to each other.

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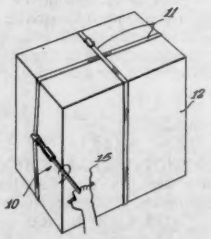
**3,599,328**

## STRAP REMOVAL TOOL

**Galdino Ursetta, Chicago, Ill., assignor to I-T-E Imperial Corporation**

**Filed Nov. 21, 1969, Ser. No. 878,704**
**Int. Cl. B25f** *1/04*
**U.S. Cl. 30—128** **10 Claims**




A tool for removing strap such as steel strap from encircling relationship about a strapped object such as a package or bundle. The tool includes a slotted end portion adapted to receive the strap and a torqueing portion adapted to be manually turned to effect a breaking of the strap and a rolling up of the strap on the end portion. The tool further includes manually operable means for expedited removal of the rolled strap from the tool subsequent to the removal of the strap from about the object.

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**3,599,329**

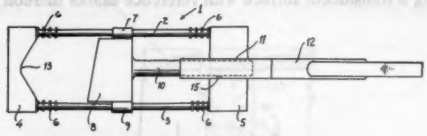
## APPARATUS FOR DEHORNING ANIMALS SUCH AS CATTLE

**Donovan Batt, Elm Glen, Lissarda, County Cork, Ireland**

**Filed Oct. 10, 1968, Ser. No. 766,467**
**Claims priority, application Ireland, Oct. 13, 1967, 830/67**
**Int. Cl. B26b** *15/00*
**U.S. Cl. 30—228** **6 Claims**

Animal dehorning apparatus including horn embracing means for receiving an animal horn, a percussion mechanism

actuable to propel a cutting blade towards the horn embracing means, movement of the cutting blade being guided by a



pair of parallel and spaced apart bars connecting the horn embracing means to a support for the percussion mechanism.

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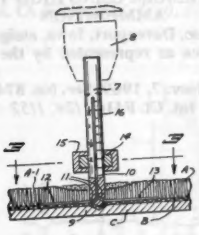
**3,599,330**
**UNDERCUTTING TOOL**
**Jacob A. Ronning, 3525 Irving Ave. South, Minneapolis, Minn.**
**Division of Ser. No. 632,629, Apr. 21, 1967, Pat. No. 3,558,384.**
**Filed June 8, 1970, Ser. No. 44,527**
**Int. Cl. B26b** *3/08*
**U.S. Cl. 30—300** **6 Claims**



A cutting tool having a shank adapted to be rotated from one end and having flexible cutters mounted in and axially adjustable with respect to the shank for projection radially outwardly from the other end of the shank so as to operate in a plane perpendicular to the shank axis, with means for adjusting the cutters longitudinally of the shank during rotation thereof to thereby control the effective cutting diameter of the cutting elements.

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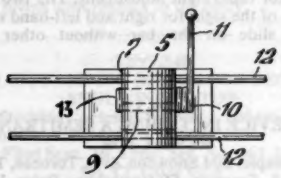
**3,599,331**
**ORTHODONTIC ELEMENTS**
**Brian W. Lee, 24 Mount Ida Ave., East Hawthorn, Australia**
**Filed June 26, 1969, Ser. No. 836,896**
**Int. Cl. A61c** *7/00*
**U.S. Cl. 32—14** **4 Claims**



The arch wire of an orthodontic tooth straightening assembly is attachable at any selected one of several different levels with respect to the crown thereof as treatment proceeds by means of a U-shape ribbon arch bracket having side slots for the arch wire located adjacent the base in the top and bottom of the sidewalls of the bracket arch itself. The bracket is attached to a band which embraces the tooth, and is also provided with a longitudinally arranged relatively short helical torsion spring having a relatively long vertical lever arm adapted to engage the tooth to urge it to turn in a desired direction.

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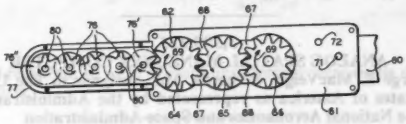
**3,599,332**
**FLUID ACTUATED DENTAL PROPHYLAXIS INSTRUMENT**
**Joseph A. Graceffo, Seneca Falls, N.Y., assignor to Helida R. Graceffo, a part interest**
**Filed June 11, 1969, Ser. No. 832,314**
**Int. Cl. A61c** *1/10*
**U.S. Cl. 32—27** **4 Claims**



A dental instrument for administering prophylactic treatment such as cleaning. The device is a hand tool in which external gear pump type gearing is fluid driven to rotate a conventional rubber cup. The pressure of the fluid within the instrument prevents the ingress of the abrasive dentifrice thereby eliminating the cause of the excessive wear that occurs in conventional prophylactic instruments of this type.

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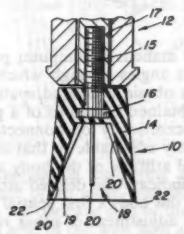
**3,599,333**
**DENTAL PROPHYLAXIS IMPLEMENT**
**Joseph C. Muhler, Indianapolis, Ind., assignor to Indiana University Foundation, Bloomington, Ind.**
**Continuation-in-part of application Ser. No. 833,644, June 16, 1969, now abandoned. This application Apr. 29, 1970, Ser. No. 32,992**
**Int. Cl. A61c** *3/06*
**U.S. Cl. 32—59** **15 Claims**



An improved dental prophylaxis implement comprises a prophylaxis cup formed of resilient material and having a cavity into which a charge of dental prophylaxis paste or the like may be placed, with up to about 15 percent by weight of an anticariogenic agent being incorporated in the resilient material of the prophylaxis cup. Additionally, or alternatively, the cup may comprise up to about 50 percent by weight of a dental cleaning and polishing agent.

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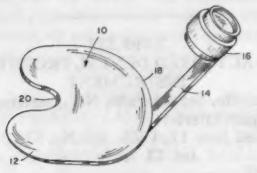
**3,599,334**
**CURVED INTRA-ORAL VISUAL PARALLELER**
**Fuller Warden, Tulsa, Okla., assignor to Grace Development Company**
**Filed Aug. 19, 1969, Ser. No. 851,253**
**Int. Cl. A61c** *3/00*
**U.S. Cl. 32—67** **1 Claim**

A curved intraoral mirror for providing an accurate visual determining of the degree of parallelism of two or more teeth in the preparation of dental bridgework, and particularly fixed bridgework. The arcuate mirror is carried by a handle

member having a lens secured thereto for facilitating viewing of the teeth and providing the optimum positioning for the




eye with respect to the reflecting surface for visual accuracy of the parallelism of the teeth.

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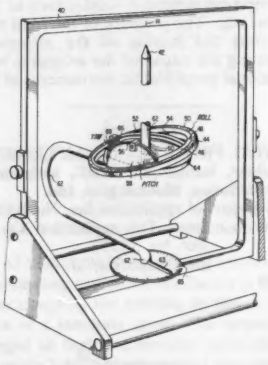
**3,599,335**

## ANALOG SPATIAL MANEUVER COMPUTER

**George E. MacVeigh, Bethesda, Md., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration**

**Filed June 6, 1969, Ser. No. 831,118**
**Int. Cl. G01b** *5/24*
**U.S. Cl. 33—15 A** **12 Claims**



An analog spatial maneuver computer provides an indication of three output angles through which a body in space must move so as to obtain a desired spatial attitude. These output angles are obtained by means of a plurality of gimbal rings arranged concentrically or connected by axles. The gimbals are selectively adjustable so that one of the rings indicates a first spatial attitude of the body and another of the rings is adapted to indicate the desired attitude of the body. The ring indicating the body's first spatial attitude is placed therein by selective adjustment of other rings among which are a third ring adjusted to represent a plane tangent to the earth at a known point; a fourth ring representing a spatial attitude of an earth support for the body prior to the time it is placed in space; and a fifth ring's attitude is adjusted to correspond to an inertial reference device located within the body. If desired, other selectively adjustable rings can be added to correct for drift of the inertial reference means.

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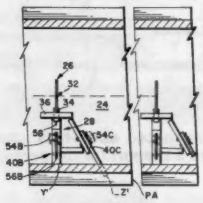
**3,599,336**

## PIPE TARGET SYSTEM AND METHOD FOR ALIGNING PIPES AND THE LIKE WITH LASER BEAMS

**Robert R. Walsh, Wilmington, Del., assignor to Technidyne, Inc., Wilmington, Del.**

**Filed Nov. 21, 1968, Ser. No. 777,778**
**Int. Cl. G01c** *15/12*
**U.S. Cl. 33—46** **8 Claims**

Target structures and a system and method for aligning pipe sections to a laser beam with same are provided which are substantially universally adaptable to position a reference index at the centerline of a pipe section, internally thereof, with a minimum number of adjustments. The target structures comprise a unique three-point mounting structure which once adjusted for a given pipe size, may be thereafter placed in the same size pipe without any adjustment and will constrain the reference point indicia thereon corresponding to that pipe size on the axial centerline of that pipe section in which it is inserted. When a target having symmetrical perforations is placed in one end of a pipe section and a target having a translucent surface with reference marks thereon is




placed in the other end of that section, if the pipe is positioned such that a laser beam aimed through the perforation of one target and onto the corresponding reference mark of the other, the pipe section will be constrained to a position in which its axial centerline is coincident with the laser beam.

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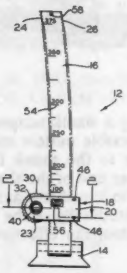
**3,599,337**

## SIGHT FOR FIREARM USING HIGH TRAJECTORY AMMUNITION

**Robert E. Snodgrass, Davenport, Iowa, assignor to The United States of America as represented by the Secretary of the Army**

**Filed Nov. 7, 1969, Ser. No. 874,736**
**Int. Cl. F41g** *1/24, 1/52*
**U.S. Cl. 33—47** **7 Claims**




A gunsight includes a metering bar with a rack formed on opposite sides for selective engagement by a pinion gear in which the sight aperture is centered. The pinion gear is mounted in a slide which permits lateral displacement of the pinion gear relative to the bar between a position wherein it is engaged to a selected one of the racks to permit fine adjustment of the sight, and a disengaged position wherein it is disengaged from the selected rack and thereby free to be slid along the bar for rapid sight adjustment. The two racks permit adaptation of the sight for right and left-hand shooters by reversing the slide on the bar without other structural changes.

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**3,599,338**

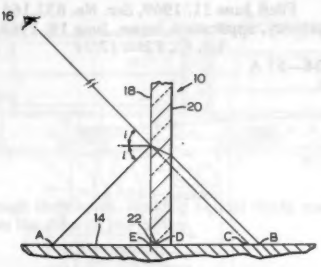
## DRAFTING DEVICE INCLUDING A SEMITRANSPARENT REFLECTOR

**Norman J. Gillespie, 204 Snowdon Ave., Toronto, 12 Ontario, and George A. Scroggie, 56 Hawksbury Drive, Willowdale, Ontario, both of, Canada**

**Filed May 20, 1970, Ser. No. 39,031**
**Int. Cl. B43l** *7/00;* **B43l** *13/00*
**U.S. Cl. 33—75** **9 Claims**

This invention relates to a geometric instrument that consists of a mirror and means for standing the mirror in a vertical disposition on a drawing surface. The mirror is formed with a guide means such as a rebated bottom edge for scribing a line on the drawing surface that is parallel to the planar reflecting surface and a distance behind the planar reflecting surface taken along a line perpendicular to the plane of said

planar reflecting surface to constitute the said line the right bisector of a line joining a first point in front of the mirror




and a second point behind the mirror. The device has many applications in geometric construction.

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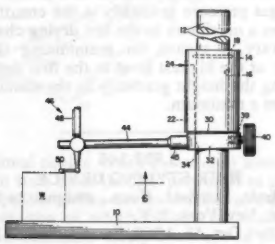
3,599,339

## MEASURING APPARATUS

Edward S. Adamczyk, 47 Mazarin St., Indian Orchard, Mass.

Filed July 30, 1969, Ser. No. 846,060
Int. Cl. G01b 3/22, 5/00, 3/32
U.S. Cl. 33—172 3 Claims



Measuring apparatus, cooperant with a platform having a post extendable vertically upwardly thereof, in the form of a clamping device slideable and rotatable on and relative to the post and including, first, a body sleeved in friction fit relation on the post and, second, a ring vertically spaced from and vertically below the body and sleeved in loose fit relation on the post and, third, a vertically extending yieldable reed connecting between the body and ring and normally spaced outwardly from the post and, fourth, an arm extending radially and outboard of the ring, and a screw means threadedly engaged in the ring diametrically opposite to the reed and in axial alignment with the arm with a manual adjusting of the screw means creating a pulling force on the ring such as to produce a slight deflection downwardly of the ring and arm as the reed pivots with respect to the body.

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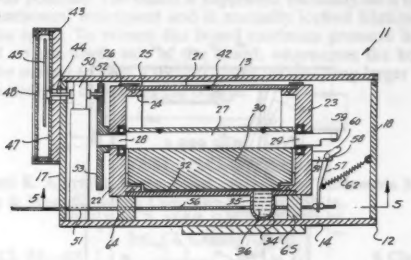
3,599,340

## PENDULUM DAMPING DEVICE FOR DEGREE AND ANGLE INDICATOR

George S. Stockton, Artesia, N. Mex., assignor to Universal Equipment Co., Inc., Artesia, N. Mex.

Filed Sept. 26, 1969, Ser. No. 861,293
Int. Cl. G01c 9/08
U.S. Cl. 33—220 R 10 Claims

A pendulum-type level indicator for use on earth-working vehicles. The indicator has a pendulum housing to which is connected a reservoir of damping liquid provided with a piston to force damping liquid into the housing. The degree of movement of the piston is controlled manually by the operator of the vehicle to provide the correct amount of pendulum damping in accordance with the type of terrain on which the vehicle is working or in accordance with the temperature conditions under which it is working. A cable-controlled manually operated mechanism is provided for locking the pendulum against rotation when use of the level indicator



is not required, so as to prevent unnecessary wear on its moving parts.

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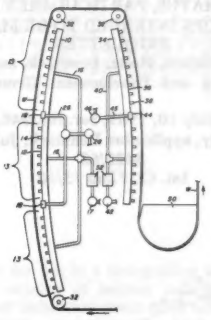
3,599,341

## METHOD AND APPARATUS FOR DRYING A WEB

Milton P. Darcy, and Joseph N. Tomlinson, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of application Ser. No. 762,242, Sept. 16, 1968, now abandoned. This application Feb. 9, 1970, Ser. No. 9,825
Int. Cl. F26b 3/00
U.S. Cl. 34—23 8 Claims



A method and apparatus for drying a web, moving in a generally convex arc of no more than 90°, by impinging air from a plenum on the concave side of the web, without contacting the convex side of the web with air jets or other support means. The efficiency of the plenum is increased by employing a plenum with a generally convex profile facing the concave side of the web and directing impinging air on the web from groups of air jet means positioned on the generally convex profile of the plenum. Intermediate adjacent air jet groups, there is positioned on the plenum supplemental air discharging means for directing air at the concave side of the web at a volume and speed different from that discharged by the air jet means to control the position of the web relative the air jet means.

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3,599,342

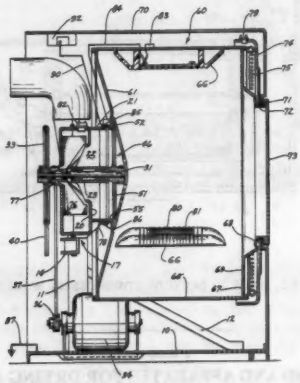
## DRYER CONTROL

Curran D. Cotton, Newton, Iowa, assignor to The Maytag Company, Newton, Iowa

Filed Mar. 3, 1969, Ser. No. 803,687
Int. Cl. F26b 13/10
U.S. Cl. 34—45 16 Claims

This control system for a clothes dryer includes a fabric dryness sensing circuit comprising a resistance-capacitance circuit portion, a neon tube, and a thyristor in the form of SCR operable for initiating termination of the dryness

sensing operation. A chime indicating the end of the drying or sensing operation is operable during the cooldown opera-



tion in a repeating manner under control of the resistance-capacitance timing circuit.

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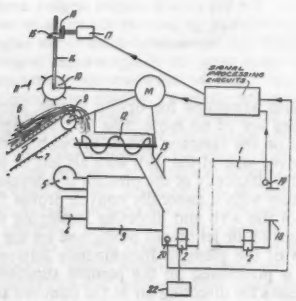
3,599,343

**DRYING APPARATUS, PARTICULARLY FOR DRYING GREEN CROPS INTENDED TO BE MADE INTO BRIQUETTES**

Alfred Thygesen Nielsen, Holte, Denmark, assignor to Unidry K/S Engineering and Development Group, Copenhagen, Denmark

Filed July 10, 1969, Ser. No. 840,754
Claims priority, application Denmark, July 12, 1968, 3423/68
Int. Cl. F26b *13/10*
U.S. Cl. 34—52 7 Claims



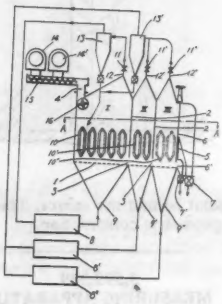
In a drying apparatus, primarily for drying green crops, a rotary drying drum receives the raw material at one end at which also a flow of heated drying air is admitted to the drum for flowing therethrough in substantially axial direction. Two temperature feelers are placed respectively at the inlet and outlet ends of the drum, and a mixture of pulses or signals from these feelers is utilized to control the supply of raw material to the drum in such a way that a balance is ensured between the constant heat production and the heat consumption.

3,599,344

**APPARATUS FOR DRYING PULVERANT MATERIALS**

Jiyuichi Nara, 2-7-8 Higashi-Ool Shinagawa-Ku, Tokyo, Japan

Filed June 11, 1969, Ser. No. 832,166
Claims priority, application Japan, June 19, 1968, 43/42361
Int. Cl. F26b *17/14*
U.S. Cl. 34—57 A 1 Claim



Apparatus for drying pulverant materials through continuous fluidization which comprises a means for keeping the gas pressure in the first drying chamber at a lowest level and increasing the gas pressure gradually in the ensuring chambers until it reaches a maximum in the last drying chamber, while, on the contrary, a means for maintaining the pulverant material layer at the highest level in the first drying chamber and decreasing the height gradually in the ensuing chambers until it reaches a minimum.

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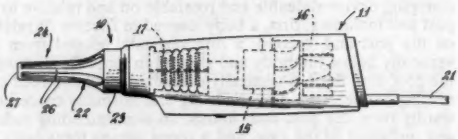
3,599,345

**HAIR-STYLING DEVICE**

Robert J. Tolmie, Fairfield, Conn., assignor to Sperry Rand Corporation, New York, N.Y.

Filed Oct. 13, 1969, Ser. No. 865,873
Int. Cl. A45d *20/10*
U.S. Cl. 34—97 10 Claims



A hair-styling device comprising an instrument adapted for insertion into the interior of a hollow hair roller. The instrument is provided with vents through which is discharged heated air which is directed outwardly of the interior of the hair roller through openings in the walls of the hair roller to set and dry hair wound about the exterior surface of the hair roller.

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3,599,346

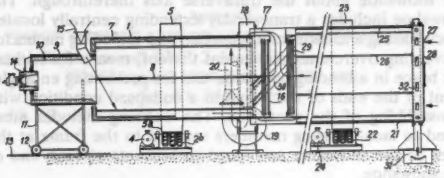
**ROTARY INDUSTRIAL DRIERS**

Guy Quesnel, Gif, France, assignor to Stein & Roubaix, Paris, France

Filed Feb. 18, 1969, Ser. No. 800,148
Claims priority, application France, Feb. 22, 1968, 140827
Int. Cl. F26b *13/18*
U.S. Cl. 34—109 4 Claims

A rotary drier and cooler having cylindrical drums resting on sets of pneumatic tires is driven in rotation about horizontal axes. The hot drying gas is generated in a hearth which is mounted on a carriage travelling on rails parallel to the axes

of the drums. Filter screens rotate with the drums to clean the hot drying gas and the cooling gas flowing in a counter-



current through the cooler. Hooded helical ducts convey the material from the drier to the cooler.

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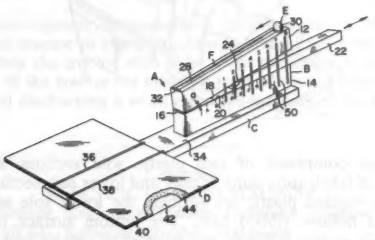
**3,599,347**
**EDUCATIONAL DEVICE**

**Roger W. Bodley, Chesterland, Ohio, assignor to Education Research Council of America, Cleveland, Ohio**

**Filed June 23, 1969, Ser. No. 835,498**
**Int. Cl. G09b *23/06***
**U.S. Cl. 35—19 R** **5 Claims**



An educational device which is useful in training and testing students in such basic thought processes as problem analysis and extrapolation. The device consists of a pair of articulated members, one of which defines an inclined track. A rolling member launched along the track is projected from the track lowermost end onto a hard surface equipped with means for recording the points of initial and secondary impact of the rolling member. The student is trained or tested by analyzing the variations in impact points.

The device also has a plurality of parallel uniformly spaced elastic bands extending between the members the lengths of which increase with distance from the point of articulation of the members. The plural bands permit the extrapolation of values which differ with different angles of articulation of the members.

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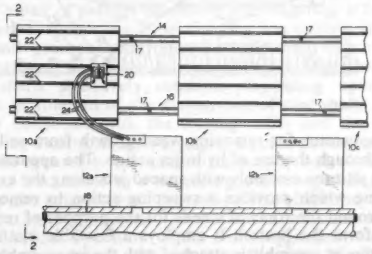
**3,599,348**
**COMPONENT DISPLAY BOARD**

**Raymond George Richardson, Toronto, and Stanley Ajax Watkins, Ontario, both of, Canada, assignors to Richardson Equipment Company Limited, Ontario, Canada**

**Filed Dec. 29, 1969, Ser. No. 888,642**
**Int. Cl. G09b *23/06***
**U.S. Cl. 35—19 R** **3 Claims**



This invention provides an improved component display board adapted to receive components such as parts of a hydraulic circuit. Each component can be releasably clamped to horizontal support bars on the board in any desired position. The board is supported vertically on a track for horizontal movement and is normally locked frictionally on the track. To release the board moderate pressure is exerted on the lower side of the board, whereupon the board can be moved to abut a second board for coupling larger and more complex circuits to the boards.

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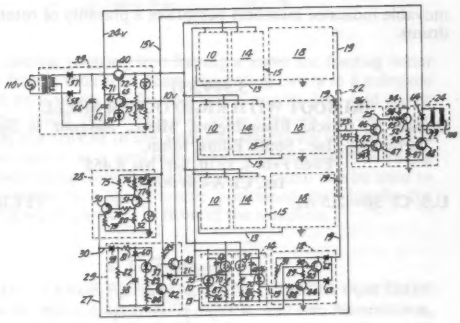
**3,599,349**
**TEST ANALYZER**

**Donald E. Albright, Hugo, Minn., assignor to Minnesota Mining & Manufacturing Company, St. Paul, Minn.**

**Filed June 2, 1969, Ser. No. 829,357**
**Int. Cl. G09b *7/06***
**U.S. Cl. 35—48** **6 Claims**



A test analyzer for use in a test-grading device, wherein in response to the sensing of answer indications in the corresponding answer indication areas of an answer sheet and an answer key, a binary comparison signal is provided by means of "exclusive or" logic for each answer indication area indicating whether the student's answer indication agrees or disagrees with the answer indication in the corresponding answer indication areas of the answer key. In a preferred embodiment, an OR logic circuit which is operatively responsive to the binary comparison signals provides an error signal for actuating a scoring device for each question in which such a disagreement is sensed. The answer indication sensing means each include a programmable unijunction transistor (PUT) having its gate lead connected to a voltage dividing network which includes an answer indication sensor in order to provide and retain at its cathode lead a binary sensing signal having the reference voltage provided at the PUT anode lead.

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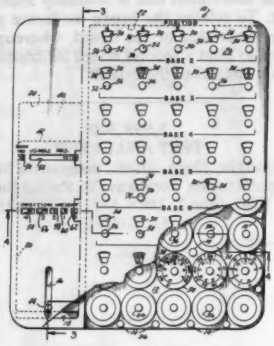
**3,599,350**
**EDUCATIONAL DEVICE FOR USE IN CONVERSION BETWEEN NUMBER SYSTEMS**

**Arthur Moskowitz, Winter Park, Fla., assignor to The United States of America as represented by the Secretary of the Navy**

**Filed Apr. 15, 1970, Ser. No. 28,839**
**Int. Cl. G09b *19/02***
**U.S. Cl. 35—30** **9 Claims**

An educational device comprising a base member, a front panel having a plurality of windows, arranged in rows and columns movable indicator members viewable through the windows to provide numeric information useful in the conversion between number systems. In one embodiment the

movable indicator members include a slide member and a plurality of rotatable discs. In a second embodiment the



movable indicator members comprises a plurality of rotatable drums.

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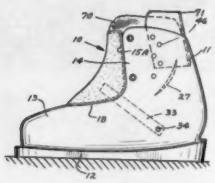
**3,599,351**

**SKI BOOT WITH RIGID OUTER SHELL**

**Donald R. Check, Bloomington, Minn., assignor to Sports Technology, Inc., South Edina, Minn.**

**Filed Feb. 4, 1970, Ser. No. 8,455**
**Int. Cl. A43b *00/00***
**U.S. Cl. 36—2.5 AL** **12 Claims**



A ski boot having a rigid outer shell comprising a sole and an upper boot portion including side members extending upwardly along the lower leg of the wearer in one rigid assembly. The shell is closed at the rear and is open to the front of the lower leg. The opening extends forwardly over the instep toward the toe of the shell to permit the foot to be inserted into the shell. An inner boot is provided which holds and pads the foot. Forward movement of the leg is resisted elastically with a resilient band extending across the open end of the rigid shell in front of the lower leg.

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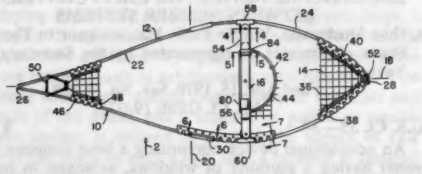
**3,599,352**

**SNOWSHOE**

**Thomas L. Novak, and Stanley Novak, both of Saint Clair Shores, Mich., assignors to Northlite Industries, Incorporated, Detroit, Mich.**

**Continuation-in-part of application Ser. No. 675,449, Oct. 16, 1967, now Patent No. 3,484,958. This application Dec. 22, 1969, Ser. No. 887,193**
**Int. Cl. A63c *13/00***
**U.S. Cl. 36—4.5** **20 Claims**



A snowshoe including a resilient frame and webbing collapsible toward the central longitudinal axis thereof and foldable about a transverse axis therethrough and the method of collapsing and folding the snowshoe. The snowshoe frame may be parted at the opposite sides thereof prior to folding the snowshoe about the transverse axis therethrough. The snowshoe includes a transversely extending centrally located brace having a scissors configuration and including means for preventing overcenter movement thereof, means for locking the brace in a bracing condition and for preventing entanglement of the ends of the brace in a collapsed condition with the webbing of the snowshoe. The webbing includes mesh laced to lace-securing members secured to the frame at the sides of the snowshoe and laced to brackets at each end of the snowshoe.

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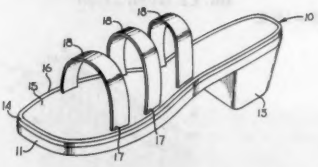
**3,599,353**

**SHOE STRUCTURE**

**Herbert Magidson, 1450 Carla Ridge, Beverly Hills, Calif.**

**Filed Aug. 6, 1969, Ser. No. 847,979**
**Int. Cl. A43b *3/12*; A43d *9/00***
**U.S. Cl. 36—11.5** **6 Claims**



A shoe comprised of two plastic sole sections and a method of fabricating same. Upper and lower sole sections of injection-molded plastic are formed, the lower sole section having a hollow, ribbed heel. The bottom surface of the upper sole section is ribbed and adapted to receive foot-holding straps and to cooperatively engage the lower sole section. The top surface of the upper sole section is covered by a plastic-backed fabric, or other appropriate covering, the covering being secured during the molding process. Foot-holding straps are disposed through openings in the upper sole section and secured to the bottom surface of the upper sole section.

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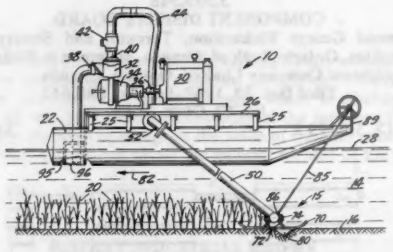
**3,599,354**

**APPARATUS FOR REMOVING WEEDS FROM SOIL UNDER WATER**

**Winston C. Larson, 1117 Minnesota Ave., Detroit Lakes, Minn.**

**Filed Oct. 18, 1968, Ser. No. 768,866**
**Int. Cl. E02f *5/28***
**U.S. Cl. 37—78** **1 Claim**



An apparatus for removing weed growth from soil under water through the use of hydrojet action. The apparatus employs a jet tube assembly with spaced jets along the extent of the same which provides a sweeping action to remove soil from around the roots of weeds for the purpose of removing weeds form the bottom It employs a floatable platform to which the jet assembly is attached with the jet assembly being pivoted on the platform which mounts a motor-driven jet assembly being pivoted on the platform and forcing it through the jet assembly under high pressures. The jet assembly is ad-

justable relative to the soil surface to insure proper cleaning operation.

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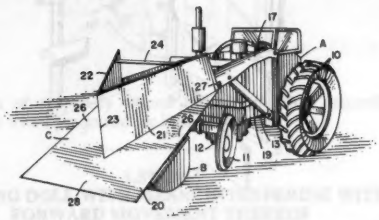
3,599,355
SNOW MOWER AND TRACTOR COMBINATION
Kenneth E. Lockwood, RRT. 2, Mallard, Iowa
Filed May 26, 1969, Ser. No. 827,688
Int. Cl. E01h 5/06
U.S. Cl. 37—49 2 Claims



A snow mower is removably mounted on a bucket-equipped tractor or tractor front support and has a lift blade wider than the tractor with plow wings extending to the top portion of the tractor for raising a mass of snow, dividing the mass and discharging it at an elevation laterally of the tractor path.

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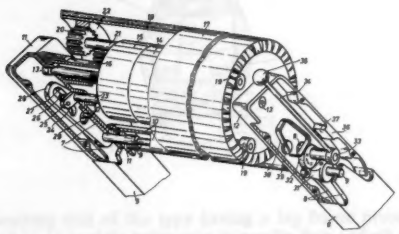
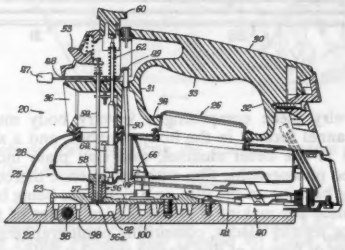
3,599,356
ELECTRIC IRONING MACHINE
Hans Buchner, Karlsruhe-Durlach, Germany, assignor to G. M. Pfaff AG, Kaiserlauternpfalz, Germany
Filed Jan. 19, 1970, Ser. No. 3,876
Claims priority, application Germany, Jan. 21, 1969, G 69 02 061
Int. Cl. D06f 63/00, 65/08
U.S. Cl. 38—59 7 Claims



An electric ironer comprises a stationary iron pad and a rotatable ironing roller operable into engagement with and retraction from said pad. The roller-operating mechanism comprises a torsion rod mounted upon the frame of the machine and serving as a rotating axis for a pivot tube bridging a pair of parallel oscillating arms to which is further connected a supporting tube carrying an electric driving motor and gearbox and rotatively supporting the ironing roller enclosing the motor and gearbox. The latter has two output shafts selectively rotatable depending upon the direction of rotation of the motor, one of said shafts being operably connected with the ironing roller and the other shaft having a crank and pin engaging a guide slot in an abutment lever secured to one end of the torsion rod whose opposite end is rotatable by a tensioning lever cooperating with a cam for the adjustment of the torsion bias of the rod and in turn of the ironing pressure. The rotation of the motor in one direction causes operation of the roller aggregate via said levers into engagement with and retraction from the ironing pad and rotation of the motor in the opposite direction drives the roller during the ironing operations.

3,599,357
ELECTRIC PRESSING IRON
Jerry P. Gronwick, Park Ridge, and Donald J. Westphal, Sough Elgin, both of, Ill., assignors to Sunbeam Corporation, Chicago, Ill.
Filed Sept. 17, 1969, Ser. No. 858,723
Int. Cl. D06f 75/06
U.S. Cl. 38—77.5 33 Claims



An electric pressing iron having a valve for feeding water slowly from a tank to a steam-generating cavity in a soleplate as well as a pump for feeding water rapidly into said cavity with the result that steam can issue through the discharge ports in the bottom of the soleplate selectively at a relatively low velocity or at a very high velocity for deeply penetrating the fabric being ironed. In addition, the pump can be used to supply water to a spray nozzle positioned in a handle for spraying water particles in front of the soleplate.

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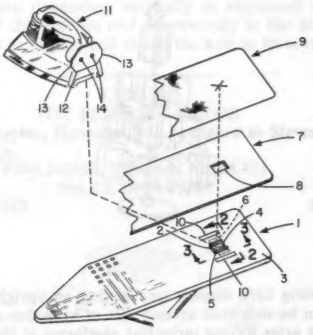
3,599,358
IRONING TABLE WITH MAGNETIC KEEPER FOR IRON
Orville R. Butts, Cherry Hill; John R. Dorner, Moorestown, N.J., and Raymond L. Hanisco, Lansdale, Pa., assignors to Proctor-Silex Incorporated, Philadelphia, Pa.
Filed July 14, 1970, Ser. No. 54,718
Int. Cl. D06f 79/02, 81/00
U.S. Cl. 38—107 10 Claims



A conventional ironing table having an opening in its board receiving a magnet and flux-shunting plate which are both movably retained therein by a bracket fixed to the underside of the board. Since a pad is generally used on the board, the magnet and shunting plate preferably project above the plane of the board and the pad is provided with an opening configured similarly to the opening in the board to receive the projections to minimize the airgap between the magnet and iron and properly balance the moments and forces acting on the iron. To supplement the retention of the iron on the table by attraction of the magnet to the steel tank of the iron, a flux-shunting plate having projecting wings for additional stabilization may be attached to the heel of the iron.

## 3,599,359
## JEWELRY PIECE

John Graham Michael, c/o Brown Wholesale Co. 2095 N. 63rd St., Philadelphia, Pa.

Filed Oct. 2, 1968, Ser. No. 764,548
Int. Cl. G09f 3/18
U.S. Cl. 40—10 8 Claims

A jewelry piece comprising a jewelry body member, a bezel channel formed in the body member, and a sign plate mounted in the bezel channel, said sign plate including a developed photographic film with intelligence thereon, and a reflecting backing on the film, said sign plate being beveled.

A method for making a series of sign plates of the same design for jewelry pieces, comprising photographing artwork on a series of frames of film having sprocket holes so that the artwork on each frame is registered with respect to the sprocket holes, developing the film to obtain a roll of film frames, affixing a reflecting backing to the developed film, positioning each film frame precisely beneath a stamping die by using the sprocket holes, stamping out the sign plates, affixing the sign plates to a jewelry piece body, and beveling the sign plate.

A sign plate comprising a developed photographic film with intelligence thereon, and a reflecting backing on the developed film.

A method of making a sign plate comprising a photographing artwork on film, developing the film to obtain a developed film with intelligence thereon, and affixing a reflecting backing to the film.

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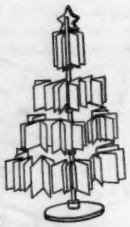
## 3,599,360
## GREETING CARD DISPLAY TREE

Theodore S. Lappo, 7470 Apple Ave., Muskegon, Mich.

Filed Dec. 5, 1968, Ser. No. 781,447
Int. Cl. G09f 1/10
U.S. Cl. 40—124.4 8 Claims



A greeting card display tree having an upright pole upon which can be mounted several sets of branches or outwardly extending arms having mounting platforms at their outer extremities for mounting a plurality of greeting cards in an upright and slightly open position. The radius of the arms decreases from the bottom to the top of the structure to give it a treelike shape.

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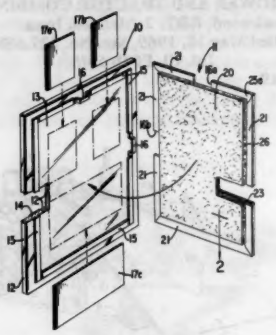
## 3,599,361
## DISPLAY FRAME FOR PHOTOS OR THE LIKE

Robert G. Bowman, Darien, Conn., and John B. Woodyard, New Providence, N.J., assignors to The C. R. Gibson Company, Norwalk, Conn.

Filed Aug. 4, 1969, Ser. No. 847,275
Int. Cl. G09f 1/12
U.S. Cl. 40—156 9 Claims

A display frame for photos or other sheetlike articles consists of two separable mating panels, each having magnetic means fixed to marginal portions thereof. The front panel has a transparent viewing area that overlies a support surface for photos, provided on the back panel. The magnetic means



join the panels together, holding the articles confined in place by the pressure resulting on them between confronting surfaces of the panels.

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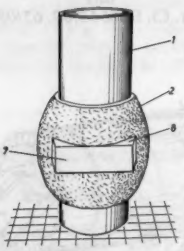
## 3,599,362
## DRINKING GLASS

Johannes Klober, Schwelm, Westphalia, Germany, assignor to Firma Hans Klober, Schwelm/ Westphalia, Germany

Filed Apr. 16, 1969, Ser. No. 816,581
Claims priority, application Germany, Nov. 13, 1968, P 18 08 631.2
Int. Cl. G09f 3/06
U.S. Cl. 40—324 5 Claims



A drinking glass slightly conically widening in upward direction including a marking means for the content to be provided therein carried by the cone, which comprises a ring member slidable onto the drinking glass and clamping itself onto the drinking glass in an engaging fit. The ring member has an arcuate outer face spaced from the drinking glass, and the latter symbolizes by shape, design and color the content to be provided in the drinking glass.

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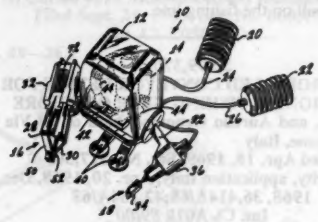
## 3,599,363
## ENVIRONMENTAL SPACE SUIT TOY

Albert R. Baginski, Torrance; David T. Okada, Hermosa Beach, and Edwin O. Stastny, Santa Ana, all of, Calif., assignors to Mattel, Inc., Hawthrone, Calif.

Filed Nov. 29, 1968, Ser. No. 780,154
Int. Cl. A63h 33/30
U.S. Cl. 46—39 9 Claims

A toy comprising an astronaut figure, a space capsule around the upper portion of the figure, pneumatically operated tools mounted on the capsule, an air pump, and tubes for coupling the pump to the tools, the tubes passing through the capsule to provide the appearance that the astronaut figure is controlling tool operation. One grasping tool

has jaws operated by a bellows that is expanded by air pressure. Another tool includes a thrust element mounted on the



inner turn of a spirally wound band, the spiral expanding lengthwise when pressured air is applied to it.

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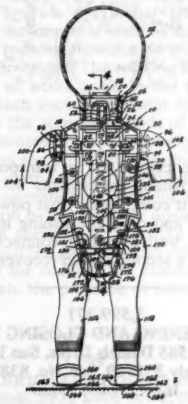
**3,599,364**

## DANCING DOLL WITH MEANS INTERFERING WITH FORWARD MOVEMENT THEREOF

**Armando J. Garcia, Sylmar, Calif., assignor to Mattel, Inc., Hawthorne, Calif.**

**Filed Sept. 25, 1969, Ser. No. 860,998**
**Int. Cl. A63h *13/02***
**U.S. Cl. 46—136** **7 Claims**



A walking doll of the type having a leg frame pivotally mounted in an upright torso on a generally fore-and-aft axis and drivingly connected to the torso by a crank for oscillating the torso and frame relative to each other about the fore-and-aft axis and in a lateral direction so that the weight of the doll is cyclically thrown onto one of the doll's legs while the other leg is lifted free of a supporting surface for forward movement is provided with a greater-than-normal crank throw and with friction-reducing means between the ground-contacting ends of the legs and the supporting surface for increasing the oscillating amplitude and for impeding forward movement of the doll so that the doll simulates dancing action. An oscillator bar connects the leg frame to the doll's arms and head for oscillating them to heighten the dancing simulation.

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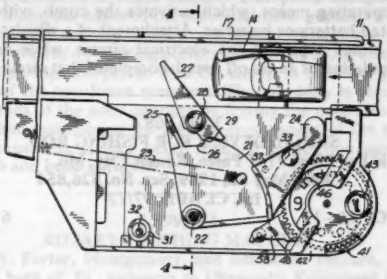
**3,599,365**

## TOY VEHICLE PROPULSION UNIT

**Richard N. Carver, Erie, and Walter Hubiak, Lawrence Park, both of, Pa., assignors to Louis Marx & Co., Inc.**

**Filed Nov. 28, 1969, Ser. No. 880,819**
**Int. Cl. A63h**
**U.S. Cl. 46—202** **7 Claims**

A propulsion unit forming a propulsion station located along a closed-circuit trackway so that, when the propulsion unit has been cocked by the operator, a force will be applied to the toy vehicle to further propel it along the trackway as



the toy vehicle traveling along the trackway passes through the propulsion station.

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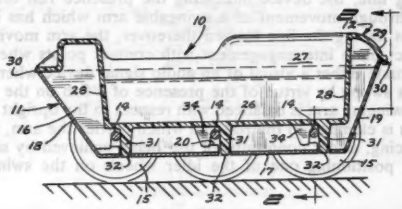
**3,599,366**

## AXLE MOUNTING FOR TOY ARTICLES

**Ronald R. Pauly, Mound, and Thomas W. Good, Plymouth, both of, Minn., assignors to Tonka Corporation, Mound, Minn.**

**Filed Nov. 25, 1969, Ser. No. 879,714**
**Int. Cl. A63h *17/26***
**U.S. Cl. 46—221** **4 Claims**



An axle mounting for a toy vehicle wherein the vehicle chassis is provided with transversely aligned downwardly opening notches having their upper closed ends offset from the open ends, an axle disposed across the chassis with its end portions seated in the upper ends of the notches, and a body member in the chassis above said notches and having a rigid projection depending vertically in alignment with the open ends of the notches and downwardly to the horizontal plane thereof to engage and retain the axle in its seated position.

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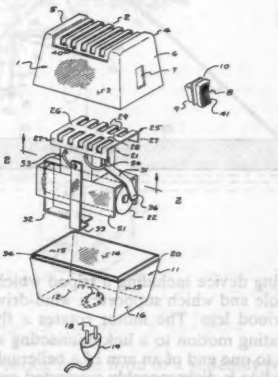
**3,599,367**

## TOY ELECTRIC RAZOR

**Beverly W. Taylor, Hermann, Mo., assignor to Steven Manufacturing Co.**

**Filed July 16, 1970, Ser. No. 55,411**
**Int. Cl. A63h *33/26***
**U.S. Cl. 46—243** **5 Claims**



A toy electric razor has a reciprocating shaving comb driven by battery powered electric operating mean. Realistic

operation is provided by requiring two distinct steps to be taken to complete the electric circuit in connecting the electric operating means, which activates the comb, with its associated battery or batteries. Attachment of a simulated wall plug closes a part of the electrical circuit, while selective manipulation of an on-off switch completes that circuit.

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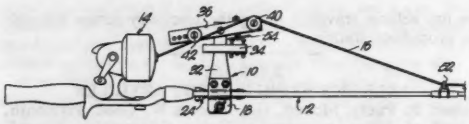
**3,599,368**
**SIGNAL DEVICE FOR FISHING ROD**
**Oathie Lee Riley, 7141 Paseo, Kansas City, Mo.**
**Filed May 22, 1969, Ser. No. 826,854**
**Int. Cl. A01k** *97/12*
**U.S. Cl. 43—17** **6 Claims**



A signal device for a fishing rod having a reel and length of fishing line, the device indicating the presence fish on the line through movement of a swingable arm which has idler wheels having the line trained thereover, the arm moving a contact plate into engagement with contact points whereby to actuate either a visual or an audio signal device when the arm is swung by virtue of the presence of a fish on the line. The swinging arm is balanced with respect to the upright post which is clamped to the rod and which carries the arm, such balancing, under conditions of use being achieved by selectively positioning one of the idler wheels on the swinging arm.

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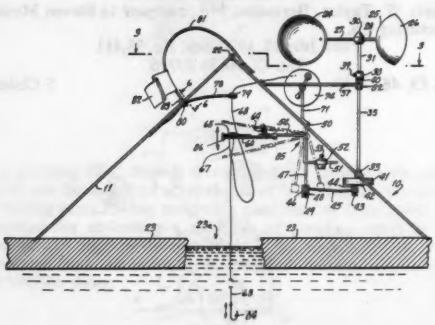
**3,599,369**
**FISHING DEVICE**
**Arthur P. Carlson, Millertown Road, Bedford, N.Y.**
**Filed June 13, 1969, Ser. No. 833,127**
**Int. Cl. A01k** *97/12*
**U.S. Cl. 43—17** **4 Claims**



A fishing device including a tripod which can be set over an ice hole and which supports a wind-driven motor on one of the tripod legs The motor rotates a flywheel to impart reciprocating motion to a link connecting a crankpin on the flywheel to one end of an arm of a bellcrank lever. A loop of a fishing line is disengageably supported on the other arm of the bellcrank lever and has an end with a baited hook thereon extending through the ice hole. Thus, the action of the wind motor imparts a reciprocating jigging motion to the line. The device also has a spring-carried flag which may be released by a pull on the fishing line.

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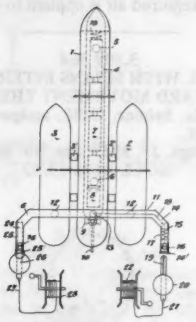
**3,599,370**
**SELF-PROPELLED CONVEYOR DEVICE FOR POSITIONING FISHING GEAR OFFSHORE**
**Pietro Armata, and Aurelio Genovese, both of 99 Via Felica Cavalotti, Rome, Italy**
**Filed Apr. 18, 1969, Ser. No. 817,307**
**Claims priority, application Italy, Apr. 20, 1968, Dec. 23, 1968, 36,414A/68;42,184A/68**
**Int. Cl. A01k** *89/00*
**U.S. Cl. 43—26.1** **7 Claims**



The conveyor device serves to transport, position and eventually to drop fishing implements at a great distance from the shore, and it comprises a float powered by a motor, and means to carry and drop the fishing implements at the desired location, as well as a line connecting them to the shore, in addition to a second line to recover the float.

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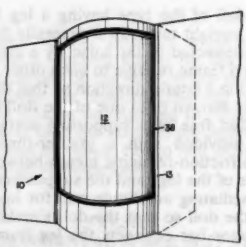
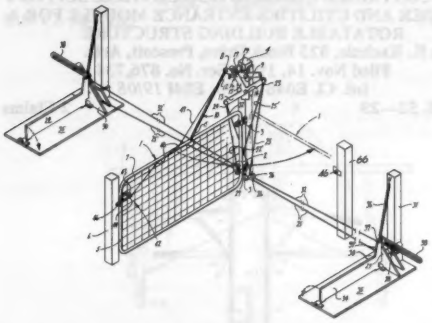
**3,599,371**
**DOOR OPENING AND CLOSING MEANS**
**Louis F. Barroero, 1585 Daniels Drive, San Leandro, Calif.**
**Filed July 3, 1969, Ser. No. 838,850**
**Int. Cl. E05f** *15/20*
**U.S. Cl. 49—30** **5 Claims**



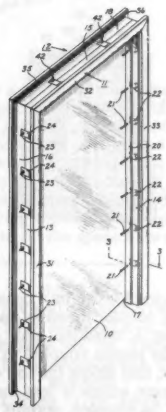
A refrigerator display case has a curved or semicylindrical door which is opened by means of a button being pressed. The door continues to open after the button is released, until the door is fully open. The door remains fully open for a certain period of time, and then starts to close. If the edge of the door, as the door moves closed, contacts the arm of the person removing product from the case or the product, the door automatically moves back to the fully open position, and remains there for such certain period of time.

3,599,372
**GATE OPENER AND CLOSER**
George N. Curtis, 4011 Millcreek Road, Healdsburg, Calif.
Filed Sept. 24, 1969, Ser. No. 860,478
Int. Cl. E05f *13/00*
U.S. Cl. 49—263 7 Claims



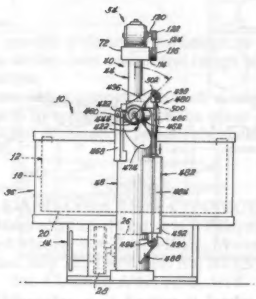
A swinging gate is hinged on a post, and a coil spring is connected at one end to the top rail of the gate and at its other end to a rocking arm so that when the rocking arm is rocked one way over center, the spring is at an angle to pull the gate closed and when the arm is rocked the opposite way over center, then the spring pulls the gate the other way into open position. There is a crossbar coordinated with the rocking arm and the opposite ends of the crossbar are connected to distant rocking elements on posts spaced from the gate in opposite directions. The rocking arm and the crossbar are in a plane at an acute angle to the plane of the gate in closed position, each rocking element is connected at each end by a cable to the respective ends of the crossbar, and a treadle plate is pivoted so it is normally held upright by a spring anchored on the adjacent post, but when an automobile runs over the plate toward the closed gate, then the treadle plate turns to operate the cables for turning the crossbar and the rocking arm over center for opening the gate, and as the car or vehicle going away from the gate runs over the other treadle beyond the gate then the other treadle moves to operate its cables for rocking the crossbar and the rocking arm over center into the previous or initial gate closing position.

3,599,373
**PREFABRICATED DOOR ASSEMBLY**
Wayne C. Coykendall, 2172 Reed Drive, Denver, Colo.
Filed Sept. 22, 1969, Ser. No. 859,855
Int. Cl. E06b *1/10*
U.S. Cl. 49—380 7 Claims



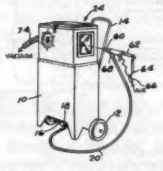
A prefabricated prehung door assembly comprises two complementary frame members each including vertical joint and horizontal head portions together with door casing attached to respective edges thereof. Flat plate clamps are secured along the edges of the jamb and head portion of one frame member and are held by nails driven through the portions and locked by locking perforations in the plate clamps. Door stop strips cooperate with the clamp to facilitate positioning of the two frame members. The assembly is secured to the studs of the door opening by driving the nails into the studs while maintaining the locking engagement of the nails and clamps—the clamps being retained in position against the jamb and head portions.

3,599,374
**ROTARY-FINISHING MACHINE**
Frank W. Porter, Montgomery, and Achille K. Ferrara, Addison, both of, Ill., assignors to Ultramatic Equipment Co., Addison, Ill.
Filed Sept. 15, 1969, Ser. No. 857,689
Int. Cl. B24b *19/00*
U.S. Cl. 51—7 26 Claims



In a rotary finishing machine of the type generally comprising a rotatable bowl adapted to contain a mass of abrasive finishing media, means for rotating the bowl, and spindle means for turning workpieces in the path of the mass of abrasive finishing media during rotation of the bowl, the spindle means is arranged for vertical, angular, and radial adjustments and is pivotally supported in a manner designed to facilitate insertion and removal of workpieces.

3,599,375
**SAND-BLASTING DEVICE**
Frank D. Nunemaker, 816 Shore Drive, Boynton Beach, Fla.
Filed Dec. 13, 1968, Ser. No. 783,671
Int. Cl. B24c *3/86*
U.S. Cl. 51—8 3 Claims



A sandblasting device in the form of a generally rectangular cabinet communicating with a sand hopper at its lower end, the cabinet having a transparent viewing window in its

top wall, an arm opening in its front wall, and a flexible panel in either an end wall or at a front corner of the cabinet. The nozzle portion of a sandblasting gun is removably secured in a central opening in the flexible panel and a baffled opening on the opposite end wall is adapted to be connected to a source of vacuum. The top wall of the cabinet is a hinged cover. An operator is adapted to insert one hand through the arm opening in the front wall to manually hold an article to be sand blasted and manipulate the gun with the other hand to direct a stream of sand against the article.

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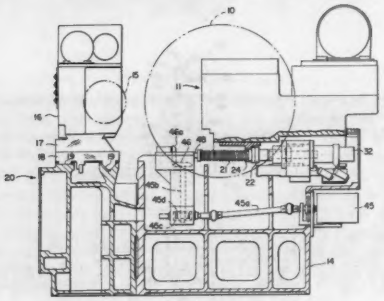
**3,599,376**

**APPARATUS FOR AUTOMATIC GRINDING**

**Howard W. Renner, and Rolf Grzymek, both of Cincinnati, Ohio, assignors to Cincinnati Milacron Inc., Cincinnati, Ohio**

**Filed Nov. 22, 1968, Ser. No. 778,208**
**Int. Cl. B24b *49/00***
**U.S. Cl. 51—165.8** **22 Claims**



A grinding wheel is moved to a reference position by a hydraulic piston, which carries a stepping motor therewith. The stepping motor advances the grinding wheel into the workpiece at varying rates and for various distances depending on the desired size of the workpiece. After completion of advancement of the grinding wheel into the workpiece, the grinding wheel may be retracted to a predetermined distance before dwell occurs.

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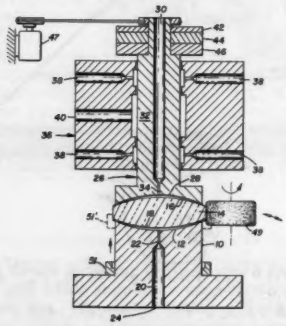
**3,599,377**

**LENS ALIGNMENT USING GAS BEARINGS**

**Robert C. Dartnell, Brighton, N.Y., assignor to Bausch & Lomb Incorporated, Rochester, N.Y.**

**Filed July 22, 1968, Ser. No. 746,350**
**Int. Cl. B24b *11/00, 9/14***
**U.S. Cl. 51—284** **7 Claims**



Disclosed is a device for aligning a lens element on an axis through the center of curvature of the major lens surfaces. The device is characterized in that spherical fluid bearings are used to position the lens so that it can be clamped for rotation about its geometrical axis.

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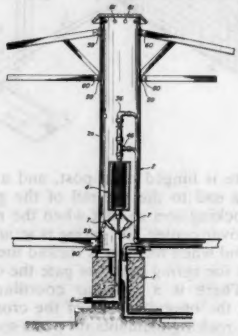
**3,599,378**

**SELF-CONTAINED COMBINATION CENTRAL SUPPORT MEMBER AND UTILITIES-ENTRANCE MODULE FOR A ROTATABLE BUILDING STRUCTURE**

**Joseph K. Kachnic, 823 Black Drive, Prescott, Ariz.**

**Filed Nov. 14, 1969, Ser. No. 876,734**
**Int. Cl. E04b *1/346;* E04f *19/08***
**U.S. Cl. 52—29** **2 Claims**



A tubular central support column provides means for attaching the major load bearing structural components of a rotatable building structure, such that the entire building structure can be lifted and transported by means attached to the top of the central column. This vertical hollow central support column encloses within it a novel utilities-entrance module which provides means for introducing all utilities at one place in a compact centrally located module. Means are also provided for removing effluent.

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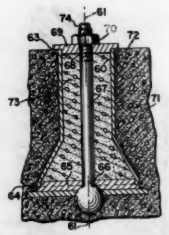
**3,599,379**

**BOLT-ANCHORING DEVICES FOR CONCRETE**

**Clarence D. Tuska, Princeton, N.J., assignor to Abram N. Spanel, Princeton, N.J.**

**Filed Jan. 21, 1969, Ser. No. 792,604**
**Int. Cl. E04b *1/41;* E04c *5/16***
**U.S. Cl. 52—127** **2 Claims**



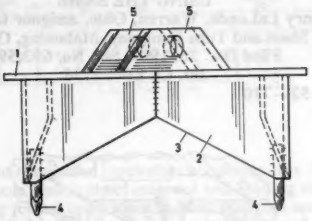
An anchoring device for use in a concrete foundation employs a longitudinal, tubular member disposed about a given axis. A bolt, having a threaded end, and a head end, is pivotally mounted by means coupled to the head end within the tubular member, and below the top open face end of the member, at a distance which is less than the length of the bolt. The head end, as coupled, permits rotational motion of the bolt about axis perpendicular to the given axis, to allow the threaded end of the bolt to be positioned at any point within the area bounded by the top open face end.

3,599,380

## SOIL-ENGAGING ELEMENT FOR A CONSTRUCTION MACHINE

Ernst Menzi, Widnau, Switzerland, assignor to Ernst Menzi AG, Widnau, Switzerland

Filed Dec. 31, 1968, Ser. No. 788,994
Claims priority, application Austria, Jan. 3, 1968, A41/68
Int. Cl. E02d 5/80
U.S. Cl. 52—155 7 Claims



A soil-engaging, supporting foot for an excavating machine or other heavy construction machine consists essentially of a plate, a hinge on the plate for attaching the plate to the machine in a normally horizontal position, a skirt depending from the plate and having a lower cutting edge extending in a closed path, and spikes downwardly projecting from the skirt. The upper edge of the skirt and the circumference of the plate define openings in the plane of the plate.

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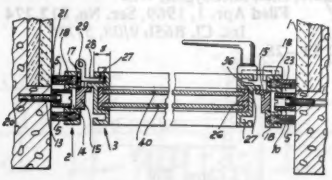
3,599,381

## METAL WINDOW OR DOOR CASING

Karl Gartner, Gundelfingen, Donau, Germany, assignor to Josef Gartner & Co., Gundelfingen am Danube, Germany

Filed Dec. 2, 1969, Ser. No. 881,545
Claims priority, application Germany, Dec. 2, 1968, P 18 12 212.8
Int. Cl. E06b 1/60
U.S. Cl. 52—217 10 Claims



A metal frame for a door or window having bushes screwable outwardly to support the frame in an opening and a seal on each side of the support bushes, each seal comprising an elastic sealing strip disposed in a groove in the frame which can be forced outwards to engage the masonry with two spaced sealing lips by the introduction of a sealing compound into the corresponding groove through openings in the frame, the sealing strip having channels through which the sealing compound can flow to fill the space between the sealing lips.

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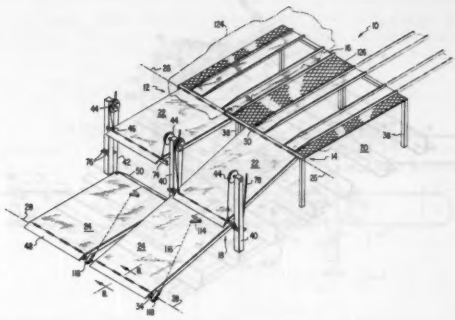
3,599,382

## AUTOMOTIVE SUPPORT STRUCTURE

Wayne B. Stone, Jr., 5115 Flanders Ave., Kensington, Md.

Continuation of application Ser. No. 730,426, May 20, 1968, now abandoned. This application Oct. 27, 1969, Ser. No. 869,959
Int. Cl. B65g 11/18; E04h 6/38
U.S. Cl. 52—175 7 Claims

The disclosure relates to an automotive support structure including a pair of ramps over which an automobile may be driven from a lower level to an elevated parking location. The ramps are mounted for pivotal movement in a common vertical plane between a first position defining an inclined path of wheel travel from the lower level to the elevated parking location and a second position in which the ramps



are vertically spaced a distance sufficient to permit an automobile to be driven over one of the ramps and beneath the other of the ramps.

The ramps are interconnected in such a manner that each of the ramps acts to counterbalance the other ramp so that a prime mover is not required to selectively position the ramps.

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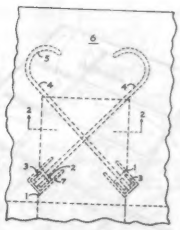
3,599,383

## PILE-AND-CONCRETE CONNECTOR

Robert Fred Moore, 1625 Third Ave., Picayune, Miss., and Alvin Edward Moore, 916 Beach Blvd., Waveland, Miss.

Filed July 22, 1969, Ser. No. 843,516
Int. Cl. E04b 1/41, 1/30, 5/16
U.S. Cl. 52—250 15 Claims



A device anchoring a concrete slab to the top of a wooden or concrete pile, preventing the concrete, when subjected to uplift, from tearing away from the pile. A notch on each side of the pile has a surface inclined upward and outward from the pile's axis and supporting concrete-anchoring means. This inclined surface resists uplifting force on the slab. One type of anchoring device comprises a rod extending thru the pile, inclined to a plane containing its axis, and ending above it in a concrete-anchoring hook. Another type comprises an angle iron, fixed in the notch, and extending laterally beyond the sides of the pile. To this angle a hooked concrete-anchoring rod (or pair of rods) optionally may be fixed.

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3,599,384

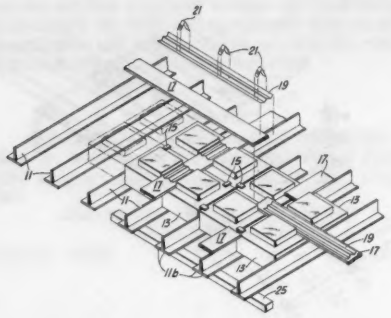
## ROOF DECK ASSEMBLY

John D. Carlson, Bradford Woods; Jack C. Lawrence, and James P. Weideman, Pittsburgh, all of, Pa., assignors to Koppers Company, Inc.

Filed June 2, 1969, Ser. No. 829,221
Int. Cl. E04d 1/36; E04b 1/66
U.S. Cl. 52—309 8 Claims

A waterproof and weatherproof roof deck assembly comprises a plurality of beams, and a plurality of adjacent water-

proof panels that rest on the beams. Each panel has a shoulder on all sides thereof that is adjacent to the shoulder of another adjacent panel to form a joint. A strip of deformable material is disposed onto the adjacent shoulders and compressed against the shoulders by a compressing means that is



placed against the material. An urging means forces the compressing means against the deformable material and a suitable sealant is placed into the joint and is subsequently bonded to the sides of the panels to form a waterproof and weatherproof joint.

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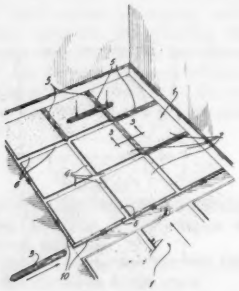
**3,599,385**

**WOOD FLOOR FINISHING CONSTRUCTION**

**Leonard LaRue, 560 Belee St., St. Dorothy, Laval, Quebec, Canada**

**Filed Sept. 25, 1969, Ser. No. 861,043**
**Claims priority, application Canada, Oct. 1, 1968, 031403**
**Int. Cl. E04f** *15/14*
**U.S. Cl. 52—460** **1 Claim**



A finishing wood covering laid over a subfloor and comprising a plurality of finishing wood panels secured over the subfloor in edge abutting relationship with each other, each panel being cut out along the abutting edges to define a recess, at the top, having a horizontal ledge and an inclined inner lateral wall, and being further cut out at the bottom along the abutting edges to form a horizontal groove. The recess and the groove of a panel define therebetween an overhanging tongue that extends fully around the panel, the top recesses of abutting panels thus having a dovetail configuration. A plurality of fastening clips are mounted on the tongues of abutting panels to hold them together and fasten them to the floor. Each clip is formed of an upstanding web disposed between the facing ends of the tongues of the corresponding abutting panels and lateral prongs projecting from the top and bottom of the upstanding web to overlie the horizontal ledges of the tongues and to be received in the bottom grooves of the corresponding abutting panels, respectively. There is for each clip, two spaced top prongs extending in one direction from the web and a further top prong extending in opposite direction between the first two prongs. There is also provided, for each clip, two spaced bottom prongs that extend in the said opposite direction while a further bottom prong extends in the one direction aforesaid between the first bottom prongs. The panels are secured to the subframe by means of a nail, for each clip, driven in the space between the first two top prongs, driven through the tongue, through the further bottom prong and into the subfloor. Finally, filler wood strips of dovetail cross section are set in the said recesses defined between the abutting panels.

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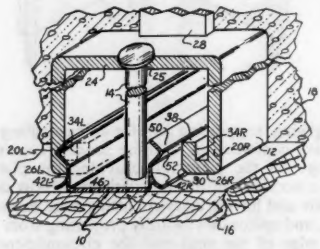
**3,599,386**

**PROTECTIVE CLOSURE MEMBER AND PROCESS FOR USING THE SAME**

**Carl Henry LaLonde, Warren, Ohio, assignor to The Youngstown Sheet and Tube Company, Mahoning, Ohio**

**Filed Dec. 26, 1967, Ser. No. 693,593**
**Int. Cl. E04b** *1/38*
**U.S. Cl. 52—710** **2 Claims**



A protective closure member particularly adapted for closing, the slot opening of a structural support element, such as a channel, during the process of embedding said element in a castable matrix, such as concrete. The closure member having a configuration complementary to portions of the support element to provide mutual interlocking and/or positioning means.

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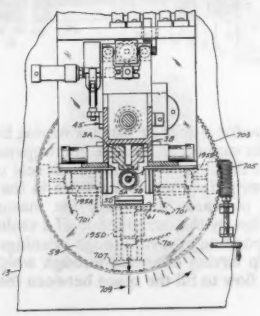
**3,599,387**

**FORM-FILL-SEAL PACKAGING APPARATUS AND METHODS**

**Robert C. James, Sheboygan, Wis., assignor to Packaging Frontiers, Inc., Sheboygan, Wis.**

**Filed Apr. 1, 1969, Ser. No. 812,274**
**Int. Cl. B65b** *9/08, 51/30*
**U.S. Cl. 53—28** **15 Claims**



Packaging apparatus of the type in which a web of flexible packaging material is formed into a tube around a mandrel, fed downward off the lower end of the mandrel in package length increments, and transversely sealed at package length intervals, adapted to form tetrahedron-shaped packages, pillow-style packages, three side seal pouches with or without gussets, and four side seal pouches, and method of utilizing the apparatus for making such packages.

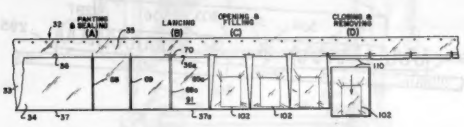
## 3,599,388
## METHOD OF AND APPARATUS FOR FORMING AND LOADING CONTAINERS

**Norman Feingold, 25 Train Drive, Great Neck, N.Y.**

**Continuation-in-part of application Ser. No. 726,443, May 3, 1968, now abandoned. This application Dec. 13, 1968, Ser. No. 787,297**

**Int. Cl. B65b** *9/08, 43/04*

**U.S. Cl. 53—29** **23 Claims**



The present invention includes apparatus for forming plastic bags from plastic sheet material and loading same, the material being folded upon itself to form first and second superimposed layers with a section for supporting and advancing the material during processing, the apparatus including means for engaging and advancing the folded sheet material, means along the path of the material for forming side closures and mouths of adjacent bags, means for thereafter cutting reliefs adjacent each mouth, optional compressed-air means for blowing air into each bag thereby opening each mouth thereof, loading means, and means further along the path of the material for simultaneously sealing each mouth and separating each formed bag from the supporting section.

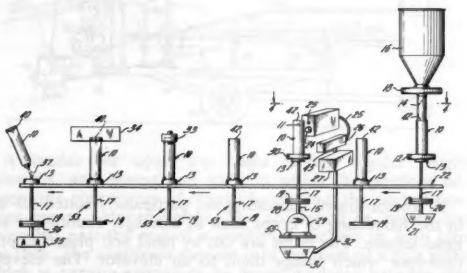
## 3,599,389
## TUBE-FILLING MACHINE WITH TUBE-POSITIONING MECHANISM

**Curtis Arnold Hartman, Elmira, N.Y., assignor to Dart Industries, Inc., Los Angeles, Calif.**

**Filed June 9, 1969, Ser. No. 831,578**

**Int. Cl. B65b** *57/00*

**U.S. Cl. 53—51** **3 Claims**



A process and apparatus for positioning a tube on a filling machine by printing a fluorescent area on the tube. The tube is then irradiated with ultraviolet light from an ultraviolet light source causing the fluorescent area to emit visible light. The tube is then rotated until the flowing fluorescent area is detected by a visible light detector and rotation is then stopped.

## 3,599,390
## CONTAINER-LOADING SYSTEM

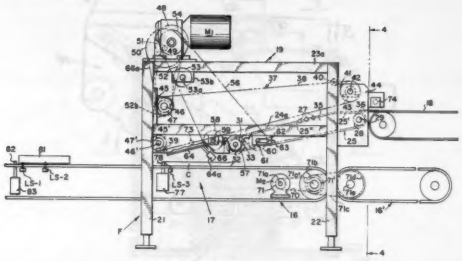
**Norman D. Krenke, Saginaw, and Charles E. Ingram, Freeland, both of, Mich., assignors to Baker Perkins Inc., Saginaw, Mich.**

**Filed Sept. 24, 1969, Ser. No. 860,481**

**Int. Cl. B65b** *57/06, 57/12, 35/44*

**U.S. Cl. 53—55** **43 Claims**

A first conveyor for containers is supplied with containers on a demand basis and is disposed under a product conveyor for conveying articles such as packaged bread which has a discharge portion in superposed generally convergent relation with the container conveyor. A stop momentarily halts each container just forwardly of the discharge portion of the product conveyor and a pusher, which is controlled by a sensor indicating that a full group of articles is available, moves the articles down the product conveyor and into the container in a manner to compress the products in the direction of travel thereof and pack them into the container. The products which are to be delivered to a given container are supplied as a group which entirely fills the container and a downstream transverse pusher member operates to transversely press or pack the articles into the container when the container is again halted.



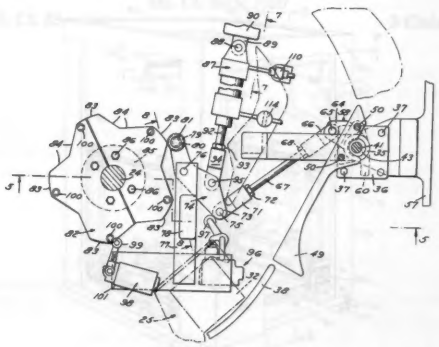
## 3,599,391
## AUTOMATIC CONTAINER EJECTOR APPARATUS

**Robert J. Allen, Farmington; Philip C. Martin, Walled Lake, and Jack M. Neumayer, Farmington, all of, Mich., assignors to Ex-Cell-O Corporation, Detroit, Mich.**

**Filed Feb. 16, 1970, Ser. No. 11,635**

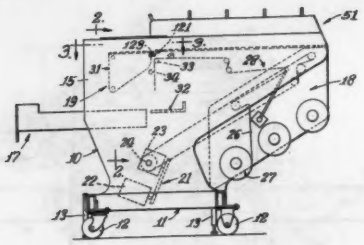
**Int. Cl. B65b** *43/26*

**U.S. Cl. 53—186** **7 Claims**



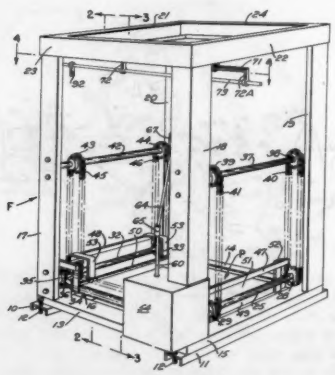
An automatic container ejector apparatus for use with a continuous motion packaging machine which erects, fills and closes containers. The ejector apparatus permits the operator to remove a carton or container for inspecting the container bottom for quality control purposes without stopping the machine. The automatic ejector apparatus includes a swingably mounted ejector arm means which is adapted to be selectively swung inward across the path of a container being moved from a bottom forming machine to a filling machine and for swinging outwardly to eject the selected container. An operating linkage means is provided for interconnecting the operation of the ejector arm means with the rotary movement of a rotary transfer unit for transferring the containers from the bottom forming machine to the filling machine. A control means is provided for selective operation of the ejector arm means.

3,599,392
SHEAR MECHANISM FOR A WRAPPING MACHINE
Eugene E. Geber, Ossian, Ind., assignor to Franklin Electric Co., Inc., Bluffton, Ind.
Filed Apr. 3, 1969, Ser. No. 813,157
Int. Cl. B65b 11/20
U.S. Cl. 53—210 7 Claims



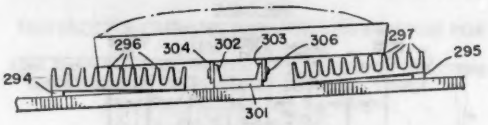
This application deals with an automatic wrapping machine including a wrapping mechanism for wrapping in a section of thin protective film each article in a series of articles. The wrapping mechanism receives film from a film feed mechanism, loops a section of the film about an article, shears the section of film from the film supply, and seals the film about the article. The mechanism for shearing the film comprises a stationary blade and two movable blades which are engageable with the stationary blade. The two movable blades are supported on joints, and a simplified mechanism is provided to simultaneously shift both movable blades at the proper time in each wrapping cycle to sever the film.

3,599,393
TAPE-LOADING APPARATUS
Owen Rodwell Read, 71 Orchard Drive, Cumberland, R.I.
Filed Mar. 24, 1969, Ser. No. 809,504
Int. Cl. B65b 39/00
U.S. Cl. 53—245 4 Claims



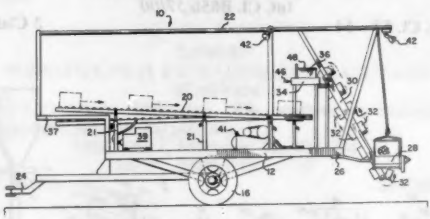
This specification discloses apparatus for loading tape into one or more boxes through the open top thereof to achieve an orderly arrangement of the stored tape. The apparatus comprises essentially a horizontal platform on which boxes are received, mechanism for supporting the platform in a desired elevated position and which provides for lowering of the platform, a worm and worm wheel included in said mechanism which maintains the elevated position of the platform, a clutch and means for actuating the second clutch to index downward movement of the platform a distance equal to the thickness of one layer of tape which is delivered to a box through its open top together with mechanism for rendering the actuating means effective upon the completion of each such layer.

3,599,394
AUTOMATIC WRAPPING MACHINES
Erik O. Vilen, Niles, Ill., assignor to Triangle Package Machinery Company, Chicago, Ill.
Division of Ser. No. 632,959, Apr. 24, 1967, Pat. No. 3,486,294.
Filed Aug. 26, 1969, Ser. No. 853,181
Int. Cl. B65b 51/10
U.S. Cl. 53—388 6 Claims



A package to be wrapped with a heat-sealable material and sealed is conveyed to a wrapping station, and after being wrapped and the outwardly extending ends of the wrapping material being folded under the package it is conveyed over a concave element so that a substantially flat-bottomed package will be supported on the heating element at the outer edges of the package where the layers of material are thicker and will be spaced from the heating element inwardly of such edges where the layers of material are thinner.

3,599,395
CROP-HARVESTING AID
Joseph Rodriguez, Long Pond, Pa.; Rafael R. Rodriguez, Long Pond, Pa.; Rafael Rodriguez, Shavertown, Pa., and Herman R. Fry, R.D. 5, Shavertown, Pa.
Filed June 5, 1969, Ser. No. 830,804
Int. Cl. B65b 76/02
U.S. Cl. 53—391 6 Claims

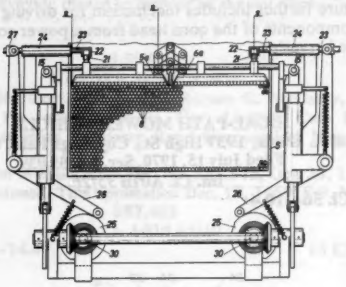


A tractor-drawn harvesting aid particularly suited for use in the harvesting of crops such as cabbage, cauliflower and head lettuce. The crops are cut by hand and placed upon a conveyor which brings them to an elevator. The elevator deposits the crops at a packing station which is supplied with containers by a second conveyor. The elevator buckets are staggered, and the packing station includes a movable divider so that the crops are distributed between two work areas of the packing station in accordance with the packing speed of the crews at those two work areas. The packed containers are moved to a closing station and then to a storage location.

3,599,396
APPARATUS FOR PACKING ROD-SHAPED OBJECTS IN CONTAINERS
Alfred Schmermund, 62 Kornerstrasse, Gevelsberg, Westphalia, Germany
Filed July 28, 1969, Ser. No. 845,272
Claims priority, application Great Britain, Aug. 14, 1968, 38,786/68
Int. Cl. B65b 5/08, 5/10, 19/10
U.S. Cl. 53—149 5 Claims

An apparatus for packing articles, such as cigarettes, cigars or cigarillos, comprising a takeup device for picking up rows of objects and depositing each row in a container with the ar-

ticles of one row lie in the recesses formed by articles of the row below. The takeup device comprises at least two parts separable from one another to vary the number of objects to



be picked up depending on whether the sections are joined together or separated from one another. Further means are provided for delivering a series of the articles over a path so that they may be picked up by the takeup device.

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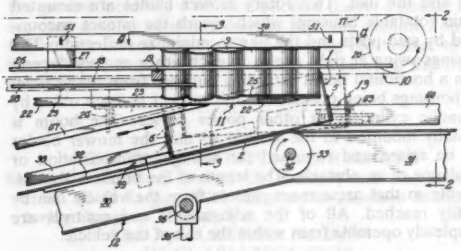
**3,599,397**
**CASE LOADER**

**Wendell E. Standley, Lake Forest; John E. Karlovitz, Chicago, and William C. Pfeil, Jr., Lincolnwood, all of, Ill., assignors to Johns-Nigrelli-Johns, Inc., Skokie, Ill.**

**Filed Sept. 16, 1968, Ser. No. 760,024**
**Int. Cl. B65b** *5/10, 39/00*
**U.S. Cl. 53—250** **2 Claims**



A loader for open top cases having regular height sidewalls, and having end walls in which the portions adjacent the corners are of regular height, but the central portions are of reduced height. The articles to be loaded are propelled past the end of a cantilever support to drop into the case. The cantilever support is in the form of a thin plate which is narrow enough to be accommodated between the regular height portions of the end wall. The outside leading articles will engage against the regular height end wall portions to advance the case as the articles are deposited therein.

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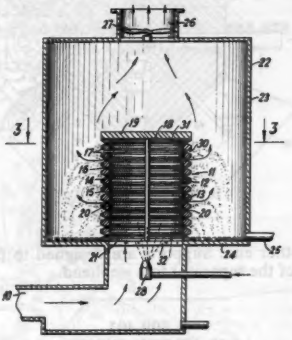
**3,599,398**
**METHOD AND APPARATUS FOR SEPARATING FOREIGN MATTER FROM GASES**

**Walter Jaeger, and Theo H. Keilpart, both of Laval des Rapides, Quebec, Canada, assignors to Ovitron Coporation, Newburgh, N.Y.**

**Continuation of application Ser. No. 693,002, Dec. 22, 1967, now abandoned. This application Jan. 12, 1970, Ser. No. 1,971**
**Int. Cl. B01d** *47/10*
**U.S. Cl. 55—84** **16 Claims**

A method and device are disclosed for separating entrained dusts and mists from a gaseous stream. The device includes a chamber for receiving a mixture of a suspended washing liquid and the gaseous stream, the chamber having at least one orifice slot passing through the wall thereof, the orifice slot being characterized by an enlarged gas entry portion which extends into the chamber wall and converges into a reduced linear throat portion. The length of the slot along the wall surface is substantially greater than the width opening of the throat portion, means being provided for accelerat-



ing the flow of the gaseous mixture through the gas entry portion and out through the throat of said slot. By accelerating the gas mixture through the slot to a speed of about 30 to 200 meters per second, the entrained material is caused to agglomerate into heavier particles which are allowed to fall out of the gas mixture after passing through the throat portion of the slot.

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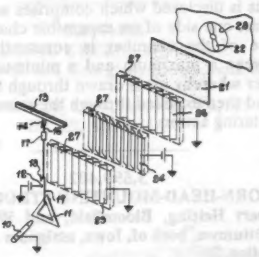
**3,599,399**
**APPARATUS FOR FILTERING POLLUTANTS**

**Thomas J. Gallen, 1516 Buck Road, Feasterville, Bucks County, Pa.**

**Filed Mar. 8, 1968, Ser. No. 713,271**
**Int. Cl. B03c** *3/00*
**U.S. Cl. 55—131** **3 Claims**



Apparatus and method for selectively withdrawing pollutants from an airstream by means of alternately grounded and charged filters.

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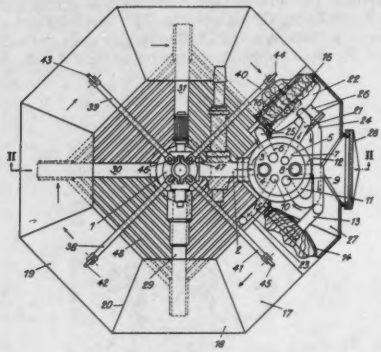
**3,599,400**
**CENTRIFUGAL CRUDE OIL SEPARATOR**

**Pierre P. Orieux, Paris, France, assignor to Compagnie Francaise Des Petroles, Paris, France**

**Filed Nov. 13, 1969, Ser. No. 876,414**
**Claims priority, application France, Nov. 14, 1968, 173,657**
**Int. Cl. B01d** *53/24*
**U.S. Cl. 55—203** **9 Claims**

An oil and gas separator for underwater installation

receives crude oil at one end of an octagonal toroidal-shaped container and discharges the centrifugally separated oil and



gas at the other end. Supports are designed to facilitate the connection of the separator to a wellhead.

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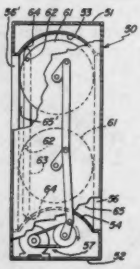
**3,599,401**
**AIR FILTER SYSTEM**
**Theodore A. Rich, Scotia, and James N. Grooves, Schenectady, both of, N.Y., assignors to General Electric Company**
**Filed Mar. 14, 1966, Ser. No. 533,888**
**Int. Cl. B01d** *46/44*
**U.S. Cl. 55—471** **1 Claim**



Apparatus is disclosed which comprises an air filter which closes at least one side of an expansible chamber. The effective volume of the chamber is constantly and cyclically varied between a maximum and a minimum by a movable wall member whereby air is drawn through the filter into the chamber and then expelled through the same filter to provide a double-filtering action.

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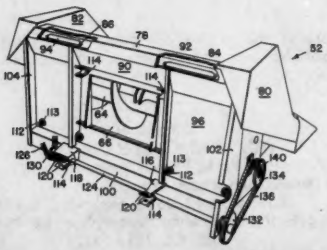
**3,599,402**
**CORN-HEAD-MOUNTING STRUCTURE**
**Robert Albert Heising, Bloomfield, and William Frederick Manns, Ottumwa, both of, Iowa, assignors to Deere & Company, Moline, Ill.**
**Filed Feb. 16, 1970, Ser. No. 11,618**
**Int. Cl. A01d** *73/00, 45/02*
**U.S. Cl. 56—2** **7 Claims**



An adapter structure for mounting a combine corn head on the cutterhead housing of a forage harvester. The structure utilizes the available mounting points on the respective units and includes a platelike member substantially enclosing the crop outlet opening of the corn head, the platelike member having an opening in fore-and-aft register with the inlet opening of the forage harvester cutterhead housing. The structure further includes mechanism for driving the operating components of the corn head from a power source on the forage harvester.

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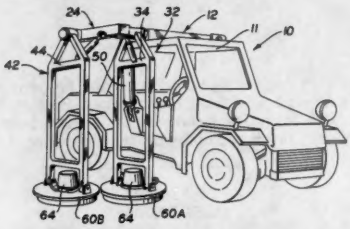
**3,599,403**
**DUAL-PATH MOWER VEHICLE**
**Marion A. Gantz, 1937 High St., Cuyahoga Falls, Ohio**
**Filed July 15, 1970, Ser. No. 55,039**
**Int. Cl. A01d** *35/26*
**U.S. Cl. 56—10.4** **9 Claims**



A vehicle carrying dual-path mowing heads for cutting vegetation primarily from both sides of continuous or discontinuous obstructions such as fences, posts, highway guard rails and the like. Two rotary mower blades are mounted within rotatable housings which absorb the impact encountered by said posts and the like to minimize deflection. The housings swing at right angles to each other as they depend from a horizontal boom extruding outward from the vehicle, the housings being positioned with respect to each other by hydraulic cylinders or other power device. The boom is pivotally mounted to the vehicle so that the mower blades can be raised and retracted for storage, transportation or avoidance of an obstacle. The length of the boom is also adjustable so that areas more remote from the vehicle can be readily reached. All of the adjustments and controls are completely operable from within the cab of the vehicle.

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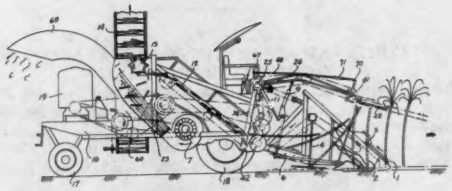
**3,599,404**
**SUGAR CANE HARVESTERS**
**Carlos Manuel Cruz Fernandez, 7605 55th St. Marianao; Rogelio Rodriguez Valdes, 21415, 67 Ave. LaLisa Marianao, and Delfin Perez Alberto, 68 Perkins St. Luyano Marianao, all of Havana, Cuba**
**Filed Apr. 8, 1969, Ser. No. 814,338**
**Claims priority, application Cuba, Apr. 9, 1968, 207-744**
**Int. Cl. A01d** *45/10*
**U.S. Cl. 56—12.8** **1 Claim**



A sugarcane harvesting combine has a mobile chassis with a supporting framework and wheels, and adjustable cane top severing mechanism consisting of a shielded disc with blades, and hydraulic adjustment means, rods to direct the cane to

the top cutting area, curved paddles to discharge the cane tops, and a stalk severing mechanism with oppositely rotating horizontal cutters on hydraulically controlled skids, means directing fallen cane into the stalk cutting mechanism, and a series of conveying means to dispose of the cut cane.

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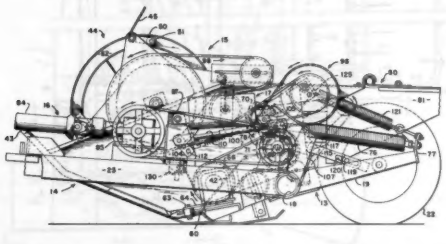
**3,599,405**
**HEADER SUSPENSION**

**Joseph C. Hurlburt, Leola, Pa.; Horace G. McCarty, New Holland, Pa., and Joseph H. Cyr, Longvic Cote D'Or, France, assignors to Sperry Rand Corporation, New Holland, Pa.**

**Continuation of application Ser. No. 589,543, Oct. 26, 1966, now abandoned. This application Dec. 17, 1969, Ser. No. 882,403**
**Int. Cl. A01d *43/10***
**U.S. Cl. 56—14.4** **16 Claims**



An agricultural machine adapted for travel forwardly over the ground including a wheel supported frame, a header having crop-treating elements thereon pivotally mounted on the frame, link means operatively connecting the header to the frame, and lift means on the frame for pivoting the frame about a horizontal axis.

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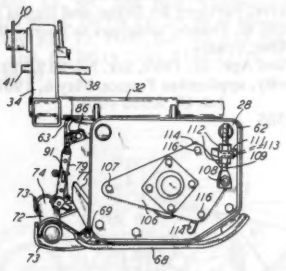
**3,599,406**
**TRACTOR-SUPPORTED LAWN MOWER**

**Sahag C. Akgulian; Donald G. Haffner, and Sherman C. Heth, all of Racine, Wis., assignors to Jacobsen Manufacturing Company, Racine, Wis.**

**Filed Apr. 9, 1970, Ser. No. 26,998**
**Int. Cl. A01d *35/26*, *55/20***
**U.S. Cl. 56—17.2** **6 Claims**



A tractor-supported lawn mower including a tractor and mowers pivotally mounted on pivot arms on the tractor. The mower has two spaced-apart side members, and the mower is of the reel type having a reel and a bed knife extending between the side members. Two skid shoes are pivotally attached to the mower to extend rearwardly thereof and to support a connector extending between the spaced-apart skid shoes. The skid shoes are movable up and down for governing the cutting height of the mower. Two additional skid shoes are attached to the side members for up-and-down adjustment to govern the positioning of the mower reel in response to rises in the ground. All the skid shoes slidably support the mower on the ground, though the mower is completely free for articulation relative to the tractor.

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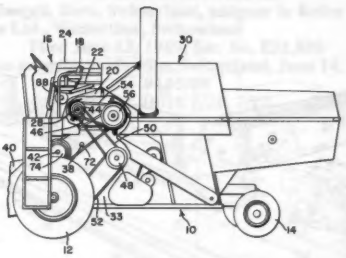
**3,599,407**
**DECLUTCHABLE BELT DRIVE FOR COMBINE COMPONENTS**

**Darwin Carl Bichel, East Moline, Ill., assignor to Deere & Company, Moline, Ill.**

**Filed Oct. 9, 1969, Ser. No. 865,078**
**Int. Cl. A01d *61/02***
**U.S. Cl. 56—11.8** **10 Claims**



A self-propelled combine has a main separator body with a transverse engine and an operator's station mounted above the front end of the body. The separator drive, which drives the driven components in the separating system, and the header drive, which drives the various driven components on the header, are both driven through a transverse shaft disposed above the main separator body behind the operator's station and the engine. The transverse shaft in turn is driven by the engine through a declutchable belt drive, which includes a drive sheave on the engine output shaft and a driven sheave on the transverse shaft, the end of the shaft on which the driven sheave is mounted being swingable toward and away from the drive sheave to respectively disengage and engage the belt from the sheaves, the swinging of the shaft being controlled by the operator from the operator's station through a mechanical linkage.

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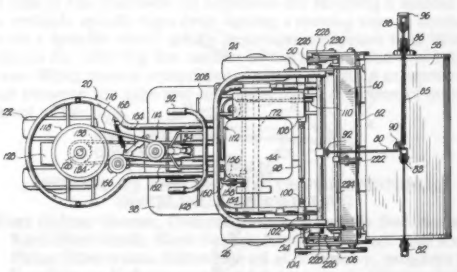
**3,599,408**
**RIDING GREENS MOWER**

**Walter Scott Craven, and George R. Brown, both of Route #1, Cleveland, Ga.**

**Filed Nov. 29, 1968, Ser. No. 779,747**
**Int. Cl. A01d *35/24***
**U.S. Cl. 56—14.4** **8 Claims**



A riding mower having a driven wheel unit which is also steerable through 360°. The prime mover is mounted on the main frame and is stationary therewith, power being delivered to the driven wheel unit on the same vertical axis about which the unit is rotated to steer the mower. A grass catcher is employed which has an opening through which a

load of clippings is discharged by a reciprocable pusher plate within the catcher. The cutter assembly is raised to an elevated, inoperative position by a winch drum powered by a friction drive connection with another of the wheel units of the mower.

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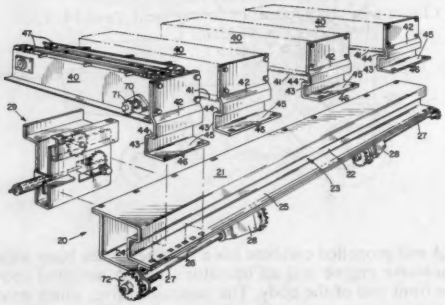
**3,599,409**
**MAIN FRAME FOR CORN HEADS**
**Martin J. Whitney, East Moline, and William L. Forsberg, Moline, both of, Ill., assignors to International Harvester Company, Chicago, Ill.**
Filed Apr. 1, 1970, Ser. No. 24,684
Int. Cl. A01d *45/02*
U.S. Cl. 56—105 8 Claims



A row-crop-gathering attachment having a plurality of row-crop-harvesting units that can be slid transversely of the attachment while being supported thereby. The row-crop-harvesting units can be releasably secured to the gathering attachment at selected locations to accommodate crops of various row spacings.

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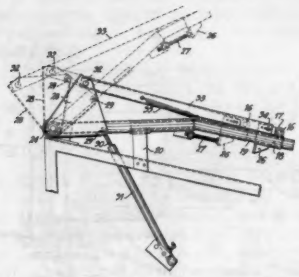
**3,599,410**
**ADJUSTABLE MOUNTING FOR A REEL ON A HEADER**
**Frans J. de Coene, Zedelgem, and Daniel C. C. Dewaele, Beselare, both of, Belgium, assignors to Sperry Rand Corporation, New Holland, Pa.**
Filed June 19, 1969, Ser. No. 834,731
Claims priority, application Belgium, June 28, 1968, 48078
Int. Cl. A01d *57/04*
U.S. Cl. 56—221 1 Claim



A header for an agricultural harvester has a rotatable reel supported on the header by two adjustable mounting mechanisms and two positioning jacks to move the reel in a horizontal fore-and-aft direction by a slidable movement and in a vertical direction by a pivotal movement about a shaft extending transversely to the rear of the reel.

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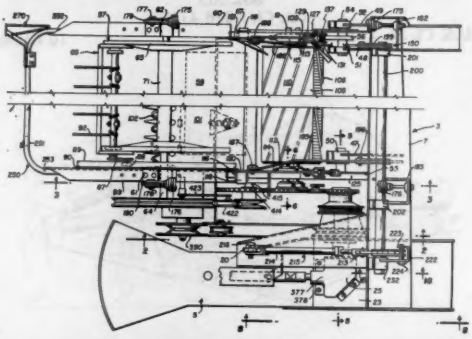
**3,599,411**
**TRANSPORT LOCKOUT FOR HARVESTERS**
**Thomas J. Scarnato, Barrington; H. Mervin Risum, Western Springs; Martin H. Meyer, Elburn, and George B. Cicci, Broadview, all of, Ill., assignors to International Harvester Company, Chicago, Ill.**
Filed Feb. 5, 1970, Ser. No. 9,023
Int. Cl. A01d *75/22*
U.S. Cl. 56—288 10 Claims



A locking device for holding an implement which is hung from a ground traversing frame in elevated transport position. The device comprises a free swing link pivoted on the frame and which is moving in a lifting direction is abuttable with a lever of the lifting linkage connected between the frame and the implement. The lever has a slot elongated in the direction of its movement and the slot is transversely alignable with a slot on an anchor lug fixed to the frame. These slots receive a pin therethrough for locking the lever to the anchor and accommodate the free link to swing away from the lever to permit separation of a hydraulic ram connected between the link and the frame. The extent and position of the slots permit storing the pin in either slot when the linkage is operational without the pin interfering with the operation of the linkage or causing the parts to break during operation of the ram if the pin is left in locking position.

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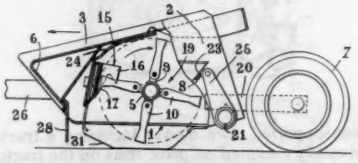
**3,599,412**
**FLAIL SHREDDER**
**Alain P. Lefeuvre, Perrigny lez Dijon, and Daniel M. Fournet, Chenove, both of, France, assignors to Sperry Rand France S.A., Les Dijon, France**
Filed Apr. 25, 1969, Ser. No. 819,379
Claims priority, application France, May 6, 1968, 150654
Int. Cl. A01d *49/00*
U.S. Cl. 56—505 13 Claims



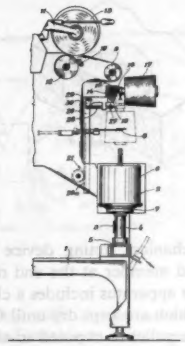
A crop cutting and shredding machine comprising a plurality of axially spaced flail elements having V-shaped notches forming a pair of reversible cutting edges and a plurality of axially spaced U-shaped stationary comb members having spaced, notched cutting edges, the flail cutting edges and the comb cutting edges cooperating to form a closing quadrilateral as the flail rotates to cut and shred crop material therebetween.

3,599,413

## APPARATUS ON A DOUBLE TWIST SPINDLE FRAME FOR SUPPLYING THE SPINDLES WITH BOBBINS AND FOR CARRYING AWAY THE EMPTY YARN CARRIERS

Klaus Nimtz, Krefeld, and Gustav Franzen, Neersen Bez. Dusseldorf, both of, Germany, assignors to Palitex Project Company GmbH, Krefeld, Germany

Filed Nov. 25, 1969, Ser. No. 879,708
Claims priority, application Germany, Dec. 6, 1968, P 18 13 110.7
Int. Cl. D01h *9/18, 9/04*
U.S. Cl. 57—53 15 Claims



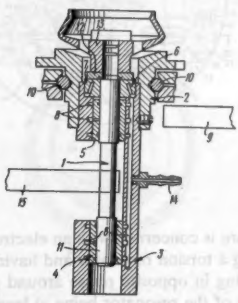
A textile machine comprising a plurality of spindles is provided with a track above the spindles, into which track there is insertable and removable a chain carrying means to hold yarn packages or yarn package supports whereby the spindles may be provided with fresh yarn packages and the yarn supports of the exhausted packages may be removed. Moreover, removal of the exhausted yarn supports from the spindles and supplying of the fresh yarn packages can be accomplished automatically by providing the chain with expanding mandrels to grip the yarn packages or yarn package supports when not positioned to service the spindles and to be freely retractable from or insertable into the yarn package or yarn package supports when positioned to service the spindles.

3,599,414

## TWISTING AND FORMING DEVICE FOR A PNEUMATIC SPINNING SYSTEM

Lev Judelevich Polyakovsky, 13 Parkovaya ulitsa, 27, korpus 4, kv. 51; Lidia Petrovna Kovaeva, Varshavskoe shosse, 9/1, kv. 40; Stanislav Markovich Balandin, Nikolo Yamsky pereulok, 4/6, kv. 64, and Igor Vladimirovich Kornev, Pogodinskaya ulitsa, 14/16, kv. 28, all of Moscow, U.S.S.R.

Filed July 17, 1969, Ser. No. 833,965
Int. Cl. D01h *7/00;* F16c *17/16*
U.S. Cl. 57—58.89 2 Claims



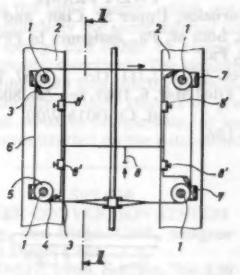
A twisting and forming device for a pneumatic spinning system includes a twisting and forming bowl supported on a shaft mounted for rotation in a pair of radial bearings adapted to be lubricated by a compressed air and also a thrust bearing assembly. The radial bearings are rigidly connected with each other and are supported on an elastic shock damping member common to both of them, the thrust bearing assembly also being adapted to be lubricated by compressed air. The thrust bearing assembly is disposed between the twisting and forming bowl and the upper of the two radial bearings, a bearing plate of the thrust bearing assembly being formed as an annular ring mounted around the rotary shaft of the device.

3,599,415

## SPINDLE STOPPING METHOD AND APPARATUS FOR IMPLEMENTING SAME

Rudolf Jaeggli, Bern, Switzerland, assignor to Reiter Machine Works Ltd., Winterthur, Switzerland

Filed June 13, 1969, Ser. No. 832,890
Claims priority, application Switzerland, June 14, 1968, 9145/68
Int. Cl. D01h *1/24, 7/22*
U.S. Cl. 57—88 14 Claims



A method of stopping spindles of drawtwisting or heavy ring twisting machines having a moving drive tape in contact with a rotating spindle whorl, comprising the steps of relieving the contact pressure between the tape and the spindle whorl by injecting compressed air into the converging space defined by the tape and the spindle whorl and braking each spindle by pressing a braking element against such spindle. There is also disclosed an apparatus for stopping a spindle of a multiple spindle tape drive having a moving tape in contact with a spindle whorl, which apparatus comprises tape lifting means for relieving the contact of the tape on the whorl, the tape lifting means comprising a nozzle injecting compressed air between the tape and the whorl in the direction of movement of the tape.

3,599,416

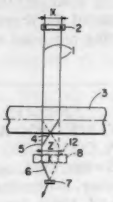
## METHOD OF AND APPARATUS FOR SPINNING, DOUBLING AND TWISTING

Kurt Helmar Reuter, Oederan; Maria Elisabeth Steinhauser, Karl-Marx-Stadt; Horst Sacher, Karl-Marx-Stadt, and Karl Heinz Silbermann, Mittweide, all of, Germany, assignors to Vereinigung Volkseigener Betriebebaumwolle Wissenschaftlich-Technisches Zentrum Baumwollspinnerei Und Zwirnerei, Karl-Marx-Stadt, Germany

Filed June 9, 1969, Ser. No. 831,543
Int. Cl. D01h *13/04*
U.S. Cl. 57—106 11 Claims

A method of and apparatus for spinning, doubling, and twisting in which fiber bands are discharged separately and at

a given distance from each other from a drafting device, are combined in a free-floating point into a thread, and the thread is guided and calmed at a point between the free-



floating point and the twisting member, while the imparted twist can unimpededly be transmitted between said free-floating point and the drafting device.

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**3,599,417**

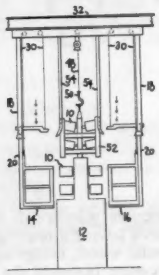
**METHOD OF PLACING PACKAGES OF STRAND ON A TWIST FRAME**

**George B. Zurheide, Upper St. Clair, and Frank E. Harvey, Pittsburgh, both of, Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.**

**Division of Ser. No. 672,211, Oct. 2, 1967, Pat. No. 3,468,434. Filed Mar. 6, 1969, Ser. No. 804,909**

**Int. Cl. D01h *9/00***

**U.S. Cl. 57—156** **3 Claims**



A crane movable along selected paths and with platforms is used to pull up storage racks on which are stored tubular fiber packages and to convey the racks to twist frames for loading with the packages. The platforms are movable vertically, adjustably and independently to positions for use of handling the packages from the storage rack to the twist frame spindles.

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**3,599,418**

**HEAT CLEANABLE COATING FOR GLASS FIBERS**

**Homer G. Hill, Newark, Ohio, assignor to Owens-Corning Fiberglas Corporation**

**Filed Dec. 13, 1967, Ser. No. 690,053**

**Int. Cl. D02g *3/36;* C03c *25/02***

**U.S. Cl. 57—164** **12 Claims**

Glass fibers coated with an easily heat cleanable size comprising a high boiling organic lubricant and a methacrylate polymer or copolymer.

**3,599,419**

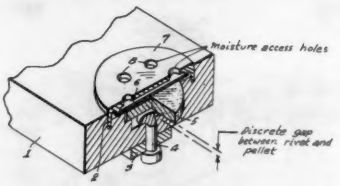
**CHEMO-MECHANICAL TIMER**

**Keith D. Anderson, Upland, Calif., assignor to The United States of America as represented by the Secretary of the Army**

**Filed May 23, 1969, Ser. No. 827,395**

**Int. Cl. G04f *1/02***

**U.S. Cl. 58—1 R** **5 Claims**




A chemical-mechanical timing device for automatically releasing a retained member at the end of a predetermined period of time. The apparatus includes a chemical pellet, and associated rivet, which are kept dry until the timing action is to begin. Then the pellet is exposed to the moisture in the ambient air, or water for underwater devices, and a chemical action is initiated between the pellet and rivet. The rivet is partially consumed and weakened to the point of releasing a retained member.

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**3,599,420**

**ELECTROMECHANICAL TIMEPIECE**

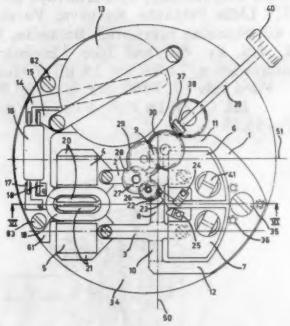
**Henri Oguey, Peseux, Switzerland, assignor to Centre Electronique Horloger S.A., Neuchatel, Switzerland**

**Filed June 21, 1968, Ser. No. 739,117**

**Claims priority, application Switzerland, June 27, 1967, 9115/67**

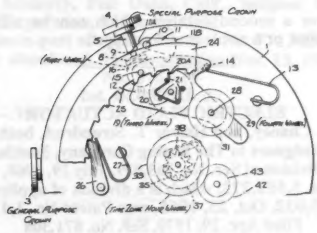
**Int. Cl. G04c *3/00***

**U.S. Cl. 58—23 V** **12 Claims**



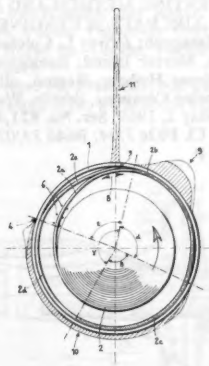
This disclosure is concerned with an electronic mechanical timepiece using a torsion resonator and having two extended masses oscillating in opposite phase around a common axis, the torsive axis of the resonator being at least approximately parallel to the plate of the timepiece and the oscillating masses being connected by a first torsion spring and connected each to a common support by separate springs.

3,599,421
**WATCH WITH MANUALLY ADJUSTABLE TIME-ZONE-SETTING MECHANISM**
Erich Werner Walker, Bienne, Switzerland, assignor to Bulova Watch Company, Inc., New York, N.Y.
Filed Sept. 24, 1969, Ser. No. 860,712
Claims priority, application Switzerland, Mar. 11, 1969, 3606/69
Int. Cl. G04b *19/22*
U.S. Cl. 58—42.5 5 Claims



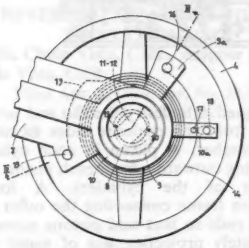
A watch provided with a time-zone-setting mechanism which is manually adjustable to incrementally shift the position of a local time hour hand in either direction, the various hands of the watch being otherwise settable by a general purpose crown. The watch also includes a date calendar or other indicator, a special purpose crown being provided which, in one axial position, adjusts the time-zone-setting mechanism and, in another position, adjusts the date calendar or other indicator.

3,599,422
**MAINSPRING SLIPPING RING FOR A SELF-WINDING TIMEPIECE**
Jean Haueter, Geneva, Switzerland, assignor to Vimetal S.A., Geneva, Switzerland
Filed Oct. 27, 1969, Ser. No. 869,561
Claims priority, application Switzerland, Oct. 29, 1968, 16111/68
Int. Cl. G04b *1/16*
U.S. Cl. 58—86 7 Claims



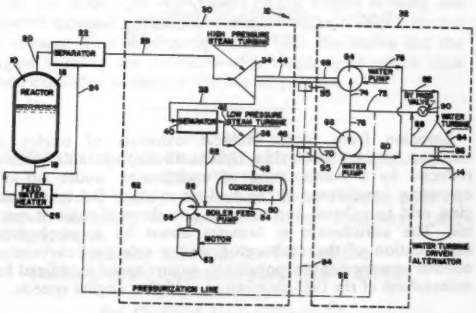
An overwind release terminal blade of a main spring in a barrel comprising one portion increasing in thickness and a second portion decreasing in thickness in the direction of the outer extremity of the terminal blade.

3,599,423
**REGULATING DEVICE FOR A TIMEPIECE**
Pierre Beguin, and Pierre-Andre Beguin, both of Le Locle, Switzerland, assignors to Portescap Le Porte, Echappement Universal S. A. La Chaux, De Fonds, Switzerland
Filed Nov. 24, 1969, Ser. No. 879,129
Claims priority, application Switzerland, Nov. 29, 1968, 17,874/68
Int. Cl. G04b *17/14*
U.S. Cl. 58—109 7 Claims



A regulating device employing two balance springs, preferably exerting the same couple, which are drawn from alloys having approximately the same thermal compensation. The two balance springs can either be coiled in the same direction or in opposite directions. The adjustments of the balance springs being such that, during their movements of expansion and contraction, their centers of gravity shift in diverging directions so as to compensate, at least partially, for the radial pressures exerted on the balance shaft.

3,599,424
**POWER CONVERSION SYSTEM**
Jack S. Yampolsky, San Diego, Calif., assignor to Gulf Oil Corporation, San Diego, Calif.
Filed Oct. 2, 1968, Ser. No. 764,530
Int. Cl. F01b *21/00*
U.S. Cl. 60—20 16 Claims

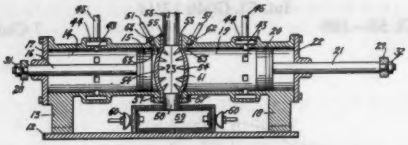



An improved power conversion system is provided for converting energy between thermal energy and mechanical energy which solves the problems of incompatibilities between the characteristics of input energy and desired output. A first subsystem is provided with first energy conversion means interacting in series with a first working fluid. A second subsystem is provided with second energy conversion units interacting in parallel with a second working fluid. Energy is transmitted between the two subsystems by a direct mechanical linkage between the output of the first conversion units and the second conversion units. A third energy conversion means converts energy between mechanical energy of the second working fluid and mechanical kinetic energy. Lubrication of the system is provided by the working fluids.

### 3,599,425
### STEAM ENGINES

Paul M. Lewis, P.O. Box 803, Sidney, Nebr.

Filed June 11, 1969, Ser. No. 832,296
Int. Cl. F02b *75/10, 41/00*
U.S. Cl. 60—27 2 Claims

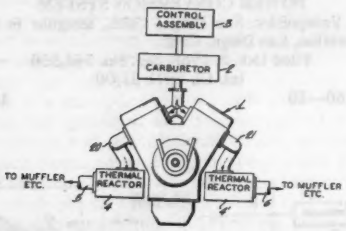


Two axially aligned cylinders joined to and projecting oppositely outward from the opposite sides of an externally fueled heating chamber. A piston in each cylinder and a piston rod projecting outwardly from each piston through the outer extremities of the cylinders. A longitudinally reciprocating piston frame connecting the outer extremities of the two piston rods so that said pistons move in unison. Means for alternately projecting jets of water against the heating chamber within said cylinders to produce charges of steam to alternately urge said pistons outwardly to impart rotation to a power shaft.

### 3,599,426
### MOTOR VEHICLE EMISSION CONTROL SYSTEM

Paul E. Oberdorfer Jr., Devon Township, Wilmington, Del., assignor to Sun Oil Company, Philadelphia, Pa.

Continuation-in-part of application Ser. No. 6,832, Jan. 29, 1970. This application May 18, 1970, Ser. No. 38,176
Int. Cl. F02b *75/10;* F02m *23/00, 23/04*
U.S. Cl. 60—29 9 Claims



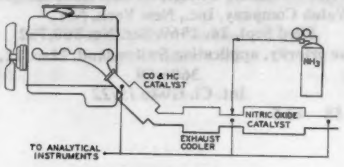

Emission from motor vehicle exhausts of oxides of nitrogen, carbon monoxide, hydrocarbons, and aldehydes is reduced by a combination of enrichment, under off-idle operating conditions, of the fuel-air mixture fed to the engine, and an exhaust converter, e.g., a thermal exhaust reactor. The enrichment is brought about by a mechanical modification of the carburetor, and a selective carburetor control arrangement responsive to engine speed is utilized for enleanment of the fuel-air mixture at higher engine speeds.

### 3,599,427
### EXHAUST GAS PURIFICATION

James H. Jones, Dearborn, and Ervin E. Weaver, Livonia, both of, Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Sept. 22, 1969, Ser. No. 859,765
Int. Cl. F01n *3/14, 3/16*
U.S. Cl. 60—30 4 Claims

This invention is concerned with a process for the effective removal of carbon monoxide hydrocarbons and the oxides of nitrogen from the exhaust stream of mobile internal combustion engines. This purification is accomplished by passing the exhaust gas from an engine operating at near the stoichiometric fuel-air ratio through a high-temperature catalyst. This catalyst is normally a noble metal catalyst. The exhaust gas is then cooled to a temperature in the vicinity of 700° F., ammonia is added and the ammoniated stream is

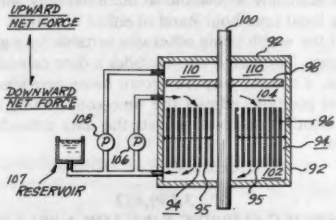



passed over a second catalyst which can be either a base metal catalyst or a noble metal catalyst.

### 3,599,428
### ELECTRIC FLUID ACTUATOR

Harold K. Chaney, and Halvor T. Strandrud, both of Seattle, Wash., assignors to The Boeing Company, Seattle, Wash.

Division of Ser. No. 763,039, July 29, 1968, Patent No. 3,552,275, which is a division of application Ser. No. 503,032, Oct. 23, 1965, now Patent No. 3,416,549.
Filed Apr. 29, 1970, Ser. No. 871,308
Int. Cl. F15b *15/18, 21/06*
U.S. Cl. 60—52 R 4 Claims

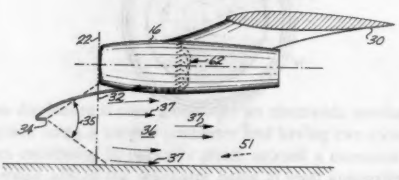



Electric fluid actuator apparatus utilizing electrically conducting plates with a field control source whereby an electric or magnetic field is established between the plates to control the effective viscosity of fluid located therebetween. Flow of fluid within the actuator mechanism is initiated by a constant flow pumps and controlled by the field control source to establish fluid pressures acting to displace the actuator mechanism.

### 3,599,429
### VORTEX PREVENTING METHOD AND APPARATUS FOR AIRCRAFT JET ENGINES

Charles F. Bigelis, Issaquah; Jeffrey L. Colehour, Bellevue; G. Dennis Davidson, Mercer Island; Bannister W. Farquhar, Seattle, and Andreas Heiberg, Renton, all of, Wash., assignors to The Boeing Company, Seattle, Wash.

Filed May 2, 1969, Ser. No. 821,427
Int. Cl. F02c *7/04;* B64d *33/02*
U.S. Cl. 60—39.09 P 3 Claims



A method and apparatus for preventing the formation of a vortex between ground and jet engine inlet so that the problem of ingestion of foreign particles through the vortex

into the engine is eliminated. The principle of operation resides in creating an artificial headwind of sufficient velocity underneath the jet engine area in order to entrain fluid flows in a direction which prevents the necessary conditions for the origin of a vortex stagnation point. An artificial headwind of sufficient velocity is created by a source of pressurized fluid connected via a conduit, extending in front of the inlet with nozzle means directed toward the area between the jet engine inlet and the ground level underneath the inlet.

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**3,599,430**

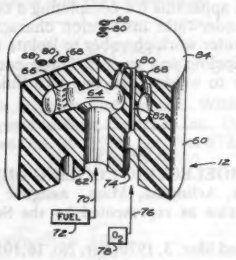
## ABLATIVE INJECTORS

**Robert V. Kromrey, Fair Oaks, Calif., assignor to Airojet General Corporation, El Monte, Calif.**

**Continuation-in-part of application Ser. No. 771,388, Oct. 29, 1968, now abandoned. This application Nov. 13, 1969, Ser. No. 876,610**

**Int. Cl. F02k** *9/02*

**U.S. Cl. 60—39.74** **6 Claims**




An injector according to the present disclosure comprises an ablative body having an injector face adapted to form a portion of a rocket combustion chamber. A plurality of ports is disposed in the injector face for injecting propellant into the combustion chamber and manifold means is integrally formed within the body for supplying propellant to said ports. According to one feature of the present invention, a mold is provided for casting the ablative injector. The injector formed by means of the mold according to the present disclosure is a unitary ablative injector for injecting propellant into the combustion chamber of a rocket engine.

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**3,599,431**

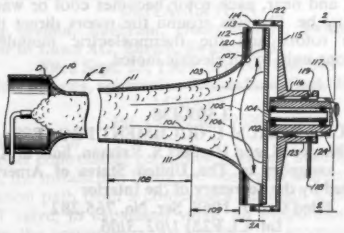
## FLUID-DYNAMIC ENGINE

**Giusto Fonda-Bonardi, Los Angeles, Calif., assignor to Robert S. Estes, Los Angeles; Edward S. Merrill, Palm Springs; Emmett Steel, Los Angeles; Jay Kurtz, Pacific Palisades; James Linahan, Pacific Palisades; Carl Clement, Pacific Palisades and Royal M. Glavin, Pacific Palisades, Calif., part interest to each**

**Filed Apr. 18, 1969, Ser. No. 817,490**

**Int. Cl. F01k** *3/18*; **F02c** *9/00*; **F02k** *1/00*

**U.S. Cl. 60—59** **9 Claims**



This invention relates to a fluid-dynamic engine wherein a gas is accelerated through the engine at the speed of sound at the sonic speed of the gas and imparting energy to the gas while maintaining it at the sonic speed. The engine may comprise a duct having a sonic duct section interposed between convergent and divergent sections so that it is successively accelerated to the sonic speed through the convergent section at the sonic speed. The engine includes means for deriving power from the fluid stream by coupling a fluid-responsive element to the stream and recompressing the fluid of the fluid stream while moving at the sonic speed.

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**3,599,432**

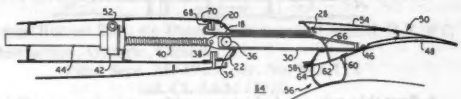
## THRUST REVERSING APPARATUS FOR TURBO-FAN PROPULSION UNIT

**Peter H. Ellis, Chula Vista, Calif., assignor to Rohr Corporation, Chula Vista, Calif.**

**Filed Apr. 2, 1970, Ser. No. 25,133**

**Int. Cl. F02k** *3/02*

**U.S. Cl. 60—226** **4 Claims**



A cowling is spaced around housing of aircraft turbo-fan engine to define therewith an annular passage for flow of fan air to the atmosphere. Cascaded thrust reversing vanes are mounted at aft end of cowling and in cruise flight are covered by a sleeve attached to the cowling, the sleeve being movable rearwardly to thereby uncover the vanes when thrust reversal is required. In one embodiment of the invention a narrow, expandable diaphragm encircles the inner wall of the sleeve, and means are provided to expand this diaphragm radially inward and into abutment with the engine housing to thereby block the fan air passage and deflect fan air through the thrust-reversing vanes. In a second embodiment, the diaphragm is mounted on the engine housing and expands outward against the deployed sleeve to block the fan air passage. In a third embodiment both the sleeve and the engine housing are provided with diaphragms which abut when expanded radially of the fan air passage.

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**3,599,433**

## METHOD OF SOIL STABILIZATION AND LEAKAGE PREVENTION

**Takao Murata, Yaizu, and Atsushi Kudo, Fujieda, both of, Japan, assignors to Sumitomo Durez Company, Ltd., Tokyo, Japan**

**Filed July 22, 1968, Ser. No. 746,530**

**Claims priority, application Japan, July 24, 1967, 47187/1967**

**Int. Cl. E02d** *3/12*; **E21b** *33/13*

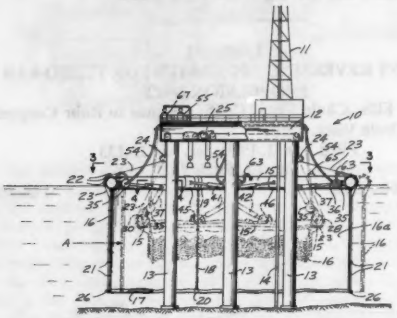
**U.S. Cl. 61—36** **5 Claims**

The present invention relates to the method of soil stabilization and leakage prevention by means of a so-called "chemical grout" using synthetic resin compositions which comprise a strong alkaline phenol formaldehyde resin liquid and a required hardening agent and/or a suitable gelation inhibitor, for example, by filling the said resin composition into the crevices and cracks of the rock bed, construction joints of concrete dam, voids of gravel, etc., for the prevention of leakage, and by grouting the said resin composition into soft ground for solidification, or by grouting into the wall of petroleum well for the prevention of crumbling and other applications for the prevention of seepage of spring water which occurs frequently in the various civil engineering works.

## 3,599,434
## DEVICE FOR CONFINING OIL RELEASED BY LEAKAGE DURING OFFSHORE OIL DRILLING OPERATIONS

Louis Missud, 61-15 43rd Ave., Woodside, L.I., N.Y.

Filed June 3, 1969, Ser. No. 829,865
Int. Cl. E02b *17/00, 15/04*
U.S. Cl. 61—46 9 Claims

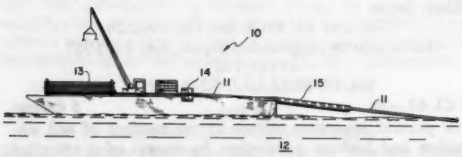


A floatable tube and skirt assembly encircling an offshore oil drilling rig for collecting oil released by leakage during the drilling operation, and movable between an operative oil-confining position and an inoperative position in noninterfering relation to the drilling shaft. The tube is connected to the rig structure by telescopically extensible arms, there being (in one embodiment) a plurality of floatable lift canisters connected to said arms and tube, each canister having perforated walls and an inner inflatable bag, an air pump on the rig being connected to said canisters and said tube. When all the canister bags and the tube are deflated, they will sink to an inoperative position, pivotally guided inwardly to that position by said telescopic arms, said arms also serving to guide the tube into its operative floating position. A drawstring arrangement contracts the skirt into compact form against the tube, in noninterfering relation to the drilling shaft.

## 3,599,435
## METHOD FOR LAYING COATED PIPELINES UNDERWATER

Robert H. Kolb, Cypress, Tex., assignor to Shell Oil Company, New York, N.Y.

Filed Aug. 28, 1969, Ser. No. 853,720
Int. Cl. F16l *1/00, 9/14*
U.S. Cl. 61—72.1 5 Claims

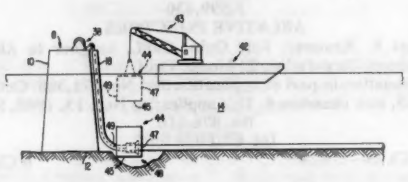


A method and apparatus for laying a pipeline underwater by coating a substantial portion of the pipeline with a corrosion-preventing masticlike material in its soft state, the material having a tendency to flow plastically. A plurality of raised portions are formed in the outer surface of the masticlike material while the material is in its soft state and the material including the raised portions is solidified. A cementatious material is applied over the hardened masticlike material; the cementatious material is then solidified and the coated pipeline is passed through a pipe-tensioning device and lowered underwater while under tension.

## 3,599,436
## PIPELINE CONNECTIONS WITH UNDERWATER WORK CHAMBER

Joe C. Lochridge, and William R. Rochelle, both of Houston, Tex., assignors to Brown & Root, Inc., Houston, Tex.

Filed Apr. 18, 1969, Ser. No. 817,495
Int. Cl. F16l *25/00, 35/00*
U.S. Cl. 61—72.3 13 Claims

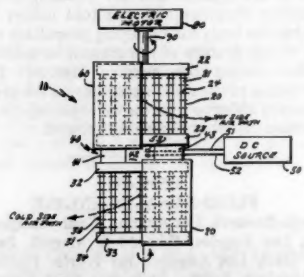


A method and apparatus for completing a connection of a pipeline to an underwater installation characterized by the use of an underwater work chamber to isolate the submerged termini of the pipeline and an installation conduit from the water body prior to welding the two into fluid communication.

## 3,599,437
## THERMOELECTRIC COOLING DEVICE

Joseph F. Panas, Arlington, Mass., assignor to the United States of America as represented by the Secretary of the Air Force

Filed Mar. 3, 1970, Ser. No. 16,101
Int. Cl. F25b *21/02*
U.S. Cl. 62—3 1 Claim




A thermoelectric cooling device. Thermoelectric modules are interposed between two cylindrical rotors of the type similar to centrifugal fan rotors, with the vanes of the rotors hollowed and filled with a reflux heat transfer fluid. The hollow vanes have fins attached to them. The thermoelectric modules are fed by a direct current source and cause one rotor to get cold and the by, rotor to get hot. The air which is flowing by, and near, each rotor becomes cool or warm, as the case may be. Shrouds around the rotors direct the air flows. The rotors and the thermoelectric modules are rotated, as one unit, by an electric motor.

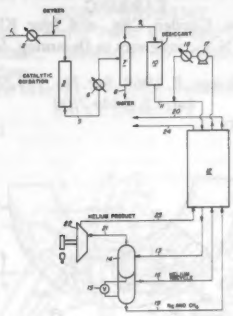
## 3,599,438
## CRUDE HELIUM ENRICHMENT PROCESS

Wayne W. Blackwell, and Herbert S. Kalman, both of Amarillo, Tex., assignors to The United States of America as represented by the Secretary of the Interior

Filed Oct. 7, 1968, Ser. No. 765,282
Int. Cl. F25j *1/02, 3/06*
U.S. Cl. 62—22 8 Claims

A crude helium stream is enriched by liquefaction and separation of contained impurities in a process wherein low temperature level refrigeration is provided by isentropic ex-

pansion of the enriched helium stream at its lowest temperature in the process.



This invention resulted from work done by the Bureau of Mines of the Department of the Interior, and the domestic title to the invention is in the Government.

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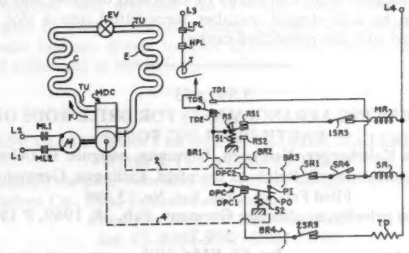
**3,599,439**
**SAFETY CONTROL FOR A MOTOR DRIVEN COMPRESSOR**

**Dwight C. Lewis, Elkhart, and Justin E. Wilder, Goshen, both of, Ind., assignors to Penn Controls, Inc., Oak Brook, Ill.**

**Filed Oct. 29, 1969, Ser. No. 872,188**
**Int. Cl. F25b** *19/00*
**U.S. Cl. 62—158** **9 Claims**



An oil pressure responsive control for a motor-driven refrigeration compressor, which control permits a predetermined, consecutive number of starts of the compressor motor. If during such starts proper lubricating oil pressure is sensed by a pressure responsive switch, the compressor motor is placed in the running mode subject to stopping by normal operating controls, such as a thermostat. Should the oil pressure fail to obtain the desired level for proper lubrication during such automatic predetermined number of starts, the system is placed on "lock out" for attention by a mechanic. Upon any successful running, the cycling starting control is automatically reset to its initial zero position.

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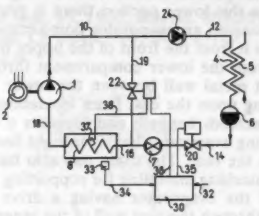
**3,599,440**
**CONTROLLABLE COMPRESSOR COOLING INSTALLATION**

**Ludwig Melion, Buchrain, Oberrohrdorf, Switzerland, assignor to Luwa AG, Zurich, Switzerland**

**Filed Sept. 23, 1969, Ser. No. 860,309**
**Claims priority, application Switzerland, Sept. 26, 1968, 14369/68**
**Int. Cl. F25b** *29/00*
**U.S. Cl. 62—158** **5 Claims**

A novel controllable compressor cooling installation is disclosed, the installation being provided with a primary coolant circulation path from a compressor, through a condenser, a shutoff valve, in expansion valve, an evaporator, and then back to the compressor. An auxiliary or secondary coolant circulation path is provided from the outlet of the compressor to the inlet of the evaporator, this secondary or auxiliary coolant path containing a second shutoff valve. In the preferred inventive embodiment, a check or relief valve is provided in the primary coolant circulation path between the branchoff of the auxiliary path and the condenser. Importantly, both shutoff valves in the primary and in the auxiliary coolant paths can be controlled in a time-delayed fashion



with respect to one another by means of a two-stage control process. The control is such that, in each instance, the shutoff valve in the primary coolant circulation path closes first and, thereafter, the shutoff valve in the auxiliary or secondary coolant circulation path opens.

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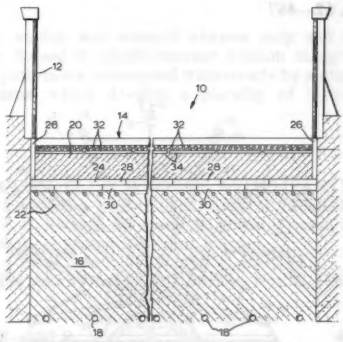
**3,599,441**
**CONSTRUCTION OF THE SUBSURFACE OF AN ICE RINK**

**Wilmen Robert Sills, c/o Doublerink Arenas Limited, R.R. #1, Downsview, Ontario, Canada**

**Filed Sept. 25, 1969, Ser. No. 861,112**
**Int. Cl. A63c** *19/10*
**U.S. Cl. 62—235** **5 Claims**



The base of an ice rink is formed of a compressed layer of sand contained in a tank of insulating material such as polyurethane; cooling pipes preferably made of plastic are located in the compressed sand.

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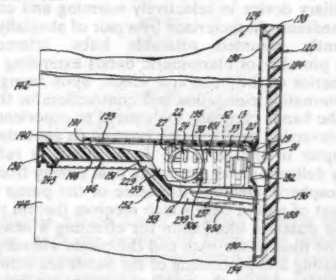
**3,599,442**
**UNITARY FAN EVAPORATOR ASSEMBLY**

**Robert S. Hanson, Dayton, Ohio, assignor to General Motors, Detroit, Mich.**

**Filed Sept. 22, 1969, Ser. No. 859,779**
**Int. Cl. F25d** *17/06*
**U.S. Cl. 62—419** **6 Claims**



In the preferred form, a refrigerator cabinet is provided with a sheet metal outer shell and a plastic inner liner with

polyurethane foam insulation in between. The interior of the inner liner is divided into an upper freezing compartment and a lower above freezing compartment by a sheet metal wall having a lower portion in the rear and a higher portion in the front. Above this lower portion there is provided cast foam insulation beneath an evaporator compartment having inlets extending to it from the front of the upper freezing compartment and from the lower compartment through the portion of the sheet metal wall between the lower and higher portions. Resting upon the cast foam insulation is a large drain pan which extends beneath and supports a tubular horizontally extending evaporator having upright fins extending from the front to the rear. The drain pan also has brackets and a vibration-absorbing mounting for supporting the fan motor at the rear of the evaporator having a drive shaft extending rearwardly through the rear wall of the inner liner where it is provided with a side inlet centrifugal fan which draws the air through the inlets and the evaporator and discharges it into an upwardly extending duct extending to the upper compartment and a downwardly extending duct extending to the lower compartment, both of which are housed in the plastic foam insulation between the rear walls of the inner liner and outer shell.

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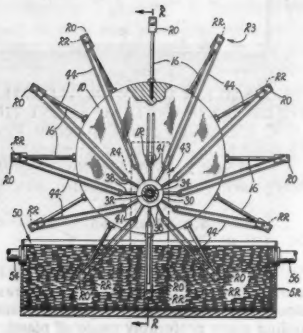
**3,599,443**

## MANUALLY ACTUATED HEAT PUMP

**T. O. Paine, DePuty Administrator of the National Aeronautics and Space Administration with respect to an invention of, and William D. Hutchinson, Altadena, Calif.**

**Filed Oct. 22, 1969, Ser. No. 868,530**
**Int. Cl. F25b**
**U.S. Cl. 62—467** **8 Claims**



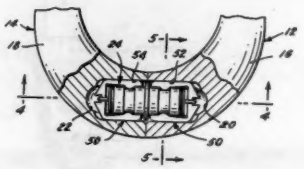
A manually actuated heat pump particularly suited for use as an auxiliary device in selectively warming and cooling an ambient medium, characterized by a pair of abaxially related, independently mounted rotatable hubs, interconnected through a plurality of elastomeric bands extending between the peripheries of the hubs and which, upon being rotated, achieve alternating elongation and contraction for the bands, whereby the bands cyclically are caused to experience a continuously reversing heat transfer process, in accordance with the principles of the so-called Joule effect in rubber, for selectively delivering and extracting heat energy from an ambient atmospheric medium, a feature of the pump being an employment of a fluid bath which receives therein the bands in selected states of elongation for effecting a heat transfer between the fluid of the bath and the bands whereby a selective preheating and precooling of the bands are achieved in a medium divorced from the ambient atmosphere for thus controlling the reversibility of the transfer of energy within the atmosphere.

**3,599,444**

## PIVOT ASSEMBLY IN A NONPIERCING HOOP EARRING

**James P. Demers, Garden City, and Igor Kling, East Williston, both of, N.Y., assignors to Demming, Inc., New York, N.Y.**

**Filed Apr. 8, 1968, Ser. No. 719,584**
**Int. Cl. A44c 7/00**
**U.S. Cl. 63—14 D** **3 Claims**



A nonpiercing earring having curved interconnected members that define a hoop, a connecting assembly pivotally interconnecting adjacent ends of the members and urging the opposite disconnected ends of the members toward each other and toward a common plane, whereby the disconnected ends may be urged into positive engaging relation with an ear, simulating a pierced earring. The connecting assembly comprises a spring housed in two sleeves, one sleeve being located in an end cavity of each said member and held therein by a U-shaped member force-fitted into a slot associated with the respective cavity.

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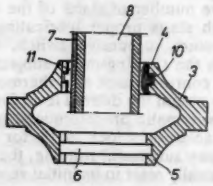
**3,599,445**

## COUPLING ARRANGEMENTS FOR DRILL RODS OF EARTH-DRILLING TOOLS

**Achim Kehrberger, Nellingen, Germany, assignor to Deimag-Maschinenfabrik Reinhold Dornfeld, Esslingen, Germany**

**Filed Feb. 20, 1970, Ser. No. 13,080**
**Claims priority, application Germany, Feb. 28, 1969, P 19 10 360.7**
**Int. Cl. F16d 3/06**
**U.S. Cl. 64—23.5** **7 Claims**



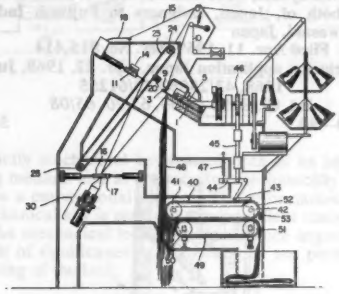
A coupling member for transmitting rotational displacement to a drill rod is disclosed. The drill rod, which has one or more rib members projecting from its periphery, passes through a bore in the coupling member. One or more expendable bearing strip members are detachably mounted on the coupling member and project into the bore to cooperate with the respective rib members to transmit rotational displacement to the drill rod. Preferably, each of the expandable bearing strip members comprises a plurality of parts and is provided with a built-up weld in that region of the respective bearing strip member which is adjacent to a cooperating projecting rib member.

3,599,446

## TERRY KNIT FABRIC, MACHINE AND METHOD OF PRODUCING SAME

John B. Lawson, Central Falls, R.I., and Daniel Frishman, Andover, Mass., assignors to Reid-Meredith, Inc., Lawrence, Mass.

Filed Mar. 21, 1969, Ser. No. 809,078
Int. Cl. D04b 7/12
U.S. Cl. 66—61 11 Claims



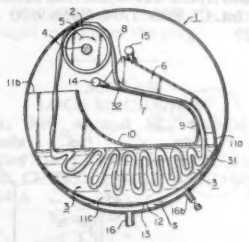
The present invention is directed to a terry knit fabric having a plain jersey base with long warp yarns interknit in selected rows of needle loops running from course to course, a method and machine for knitting same wherein long lengths of warp yarns after being engaged with hooks in the needle bed are drawn to their desired long length, clamped and either cut or left in loop condition.

3,599,447

## APPARATUS FOR TREATING TEXTILE MATERIALS WITH A TREATING LIQUID

Masahiro Arashi, Komatsu-shi, Japan, assignor to Komatsu Seiren Co., Ltd., Komatsu-shi, Japan

Filed Jan. 16, 1970, Ser. No. 3,461
Int. Cl. B05c 3/02; D06f 17/02
U.S. Cl. 68—177 12 Claims



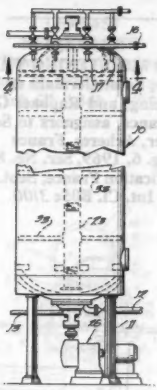
An apparatus is provided for treating textile material with a treating liquid and comprises a tank containing a treating liquid and means for circulating the textile material through the tank. The tank is provided with a plurality of treating passages each comprising an accumulating zone and a transfer zone. The transfer zone has an inclined bottom portion inclined from 15 to 45 degrees with respect to a horizontal plane and ejecting means are provided for ejecting the treating liquid into the transfer zone in such a manner that the textile material is opened while in a substantially relaxed condition as it flows through the transfer zone thereby eliminating wrinkles formed in the textile material.

3,599,448

## DIFFUSION PULP WASHER

Frank B. K. Green, 10835 S. W. Muirwood Drive, Portland, Oreg.

Filed Sept. 19, 1969, Ser. No. 859,319
Int. Cl. D21d 5/28; D06f 39/10
U.S. Cl. 68—181 R 3 Claims



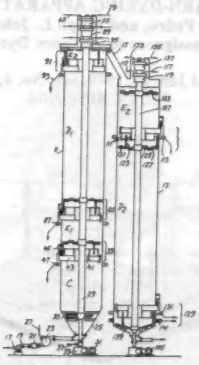
A pulp washer and method wherein pulp and washing liquid are flowed in countercurrent relation along a given path, the path being interrupted transversely by a plurality of rotating arms which develop a plurality of high-dilution zones.

3,599,449

## CELLULOSE BLEACH TOWER WITH MEANS FOR SPREADING A BLEACHING AGENT THEREIN

Johan C. F. C. Richter, St. Jean Cap Ferrat, France, assignor to Aktiebolaget Kamyr, Karlstad, Sweden

Filed Nov. 5, 1968, Ser. No. 773,385
Claims priority, application Sweden, Nov. 6, 1967, 15150/1967
Int. Cl. D21d 5/02
U.S. Cl. 68—181 R 4 Claims



A cellulose bleach tower in which at least two different bleaching steps are performed upon pulp flowing continuously therethrough, is provided with a set of concentric cylindrical screens through which a liquid containing used bleaching chemicals is drawn off the pulp at the end of the first bleaching step. A liquid containing the bleaching chemical of the second step is spread by nozzles moving between

or laterally of the screens. After the pulp has passed the screens and before the main part of the second bleaching step has taken place, the concentration of the bleaching chemical is equalized over the cross section of the tower by means of rotating scrapers which in a short zone of the tower displace the pulp back and forth in the transverse direction of the tower, whereas the pulp else flows truly axially of the tower.

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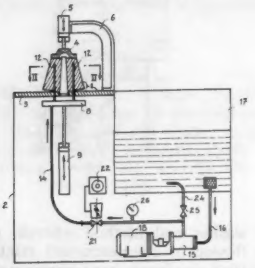
**3,599,450**

## APPARATUS FOR MOISTENING THREAD BOBBINS

**Philippe L. A. Giesler, Saint Germain en Laye; Robert F. MJ Desurmont, Tourcoing, and Raphael G. G. DeJonckheere, Bondues, all of, France, assignors to Societe D'Application Des Procedes Giesler, Acheres, France**

**Filed Aug. 6, 1969, Ser. No. 847,873**
**Claims priority, application France, Sept. 25, 1968, 167,454**
**Int. Cl. B05c** *3/00*
**U.S. Cl. 68—201** **3 Claims**



The invention provides an apparatus for moistening cylindrical or tapered cross-wound thread bobbins of all dimensions, by injection of an appropriate fluid, such as water with the addition of a wetting agent, by means of hollow needles which are implanted in the bobbins.

The ends of the needles are closed and blunted in the form of a solid of revolution, for example in ogive form, while their bodies have lateral holes distributed over various generatrices.

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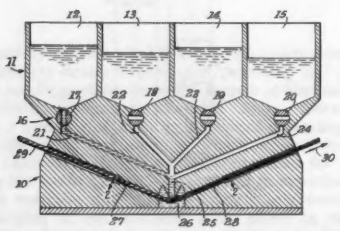
**3,599,451**

## YARN-DYEING APPARATUS

**John L. Getz, San Pedro, and Ralph L. Johnson, San Gabriel, both of, Calif., assignors to Advance Dye Systems, Los Angeles, Calif.**

**Filed Jan. 21, 1970, Ser. No. 4,504**
**Int. Cl. B05c** *1/04*
**U.S. Cl. 68—207** **8 Claims**



Yarn-dyeing apparatus having a dye head through which a plurality of threads or yarns, that are highly absorbent, are passed, is provided with at least two dye-dispersing tanks and with flow valve means to selectively conduct liquid dye from said tanks to a dye chamber in said head to be absorbed by threads or yarns passing transversely therethrough. Each tank is provided with a float that, according to the level of dye therein, controls flow of dye from replenishing reservoirs to the respective tanks. The valve means is controlled by cams, solenoids, or similar program-type means and operative to differently color the threads or yarns along different longitudinal portions thereof and by preselected color schemes.

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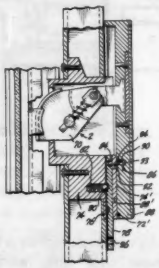
**3,599,452**

## COLLISION-SAFEGUARDED LATCH MECHANISMS FOR SLIDABLE SASHES

**Toshiaki Maruyama, Yokohama, and Isamu Yamanishi, Tokyo, both of, Japan, assignors to Fujisash Industries, Ltd., Kawasaki, Japan**

**Filed Apr. 11, 1969, Ser. No. 815,414**
**Claims priority, application Japan, Apr. 22, 1968, July 19, 1968, 43/25552;43/61255**
**Int. Cl. E05b** *47/00, 63/20, 65/08*
**U.S. Cl. 70—90** **5 Claims**



A collision-safeguarded latch mechanism is disclosed for slidable sashes. The latch is extendible from one sash, to engage with a keeper on the other sash, when the sashes are closed; but a latch-retainer mechanism is employed to prevent the latch from being extended when the sashes are relatively displaced in the open condition thereof. The latch may be operated by a handle-actuated toggle mechanism, and may be locked in the latched position thereof by a magnetically actuated pinlock mechanism which is released by a key.

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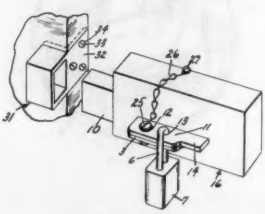
**3,599,453**

## SECURITY LOCK

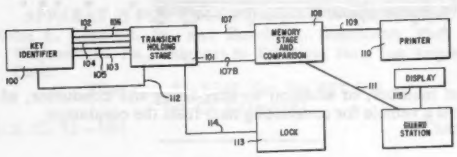
**Joseph Bauernfeind, 64 Washington Ave., West Sayville, N.Y.**

**Filed Apr. 29, 1970, Ser. No. 32,831**
**Int. Cl. E05c** *1/04*; **E05b** *9/00*
**U.S. Cl. 70—129** **8 Claims**



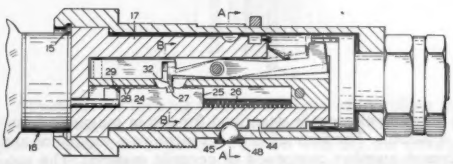
A security lock which is tamperproof and can be affixed to the inside or outside of a door which opens either from the right or left, capable of functioning as a security bolt per se, a security bolt with a padlock and/or a key. The security lock comprises a baseplate provided with a pair of integral guide means for a sliding bar, one guide means being provided with an integral padlock accommodation means which cooperates with a padlock accommodation means integral with said sliding bar. A swivel lever attached to the baseplate and activated by a key is capable of sliding the sliding bar into an open or closed position. This provides for both padlocking and locking with a key any type or size door.

3,599,454
KEY READER AND IDENTIFIER SYSTEM
John A. Hill, New Haven, and Charles A. Bauer, Woodbridge, both of, Conn., assignors to Sargent and Company, New Haven, Conn.
Filed Dec. 31, 1969, Ser. No. 889,405
Int. Cl. E05b 47/04, 47/06, 63/14
U.S. Cl. 70—265 11 Claims



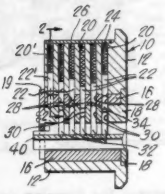

A strictly mechanical key is used both as an information-carrying medium and as a device for mechanically unlocking a lock in a conventional manner. The information stored on the mechanical key is read at an independent station prior to use in the mechanical lock. The intelligence imparted to the station is of significance in permitting or not permitting the functioning of the lock.

3,599,455
TUMBLER LOCK
Aksel Pilvet, Coe Hill, Ontario, Canada, assignor to Sigmund Knaul, Toronto, Ontario, Canada, a part interest
Filed July 1, 1970, Ser. No. 51,497
Claims priority, application Canada, July 24, 1969, 057834
Int. Cl. E05b 17/04, 19/12, 29/08
U.S. Cl. 70—363 7 Claims



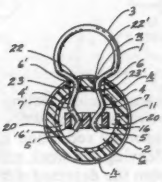
In a tumbler lock including a freely rotatable plug and a clutch element which is permitted to move into an operative lock-engaging position only when the tumblers have been set by a proper key, the clutch element is normally biased to an inoperative position and an inertial cam member is provided for moving the clutch element towards its operative position in response to rapid rotation of the plug.

3,599,456
LOCK MECHANISM
Bessim Bessim, 349 Arcand St., Cap-De-La-Madeleine, Quebec, Canada
Filed Apr. 13, 1970, Ser. No. 27,471
Int. Cl. E05b 25/00, 27/00, 35/08
U.S. Cl. 70—364 A 10 Claims



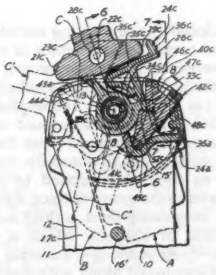
A lock incorporating two locking positions and formed by a body with a key plug and cylinder coaxially rotatable therein. Locking pins in the body plug and cylinder adapted to be aligned by one key so as not to transverse the line of junction between the cylinder and key plug and with another key so as not to transverse the line of junction between the cylinder and body of the lock. A further pin within a further hole in the cylinder in one position locks the cylinder and key plug together.

3,599,457
KEY HOLDER
Emil W. Kamp, 242 Palm Drive, Hazelwood, Mo.
Filed Aug. 20, 1970, Ser. No. 65,387
Int. Cl. A44b 15/00
U.S. Cl. 70—459 7 Claims



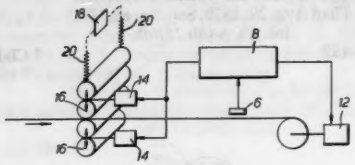
A key holder comprising a key ring formed from a length of resilient wire stock and bent to provide a loop and a pair of leg portions, a discoidal body formed of plastic, means for mounting a flat, indicia-bearing element on at least one side of said body, means for detachably engaging said key ring leg portions within said body inwardly of the indicia-bearing member, and a leg retainer provided interiorly of said body for accepting said ring legs to prevent contact between same and the indicia-bearing member.

3,599,458
KEY CASE
Ho Chow, and Junlin Wong Chow, both of 31 Coles Court, River Edge, N.J.
Filed Sept. 15, 1969, Ser. No. 857,860
Int. Cl. A47g 29/10
U.S. Cl. 70—459 27 Claims



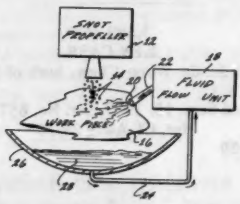
A convenient key case having one or more pockets structured to have a nonremovable holding means for each pocket to hold a key having a head and a body and to move the desired key to a load, store or use position, at the load position the key is easily and quickly inserted in or removed from the holding means, at the store position the key is stored in the pocket of the case, and at the use position the body of the key is exposed and has a part of the head remaining inside the pocket and nondetachable from the holding means.

3,599,459
SHAPE OF SHEET MATERIAL
Kenneth A. Yeomans, Worksop, and Bruno Sabatini, Thames Ditton, Surrey, both of, England, assignors to The British Iron and Steel Research Association, London, England
Filed Mar. 20, 1969, Ser. No. 808,962
Claims priority, application Great Britain, Mar. 25, 1968, 14325/68
Int. Cl. B21b 37/12
U.S. Cl. 72—8 12 Claims




Method and apparatus for correcting and controlling the profile of the gap between loaded work rolls by first detecting differences in fractional reduction causing bad shape of rolled strip material leaving the work rolls, and then deriving in a particular way from the detected differences in fractional reduction, control signals to control a plurality of different rolling mill control means for adjusting the profile of the gap.

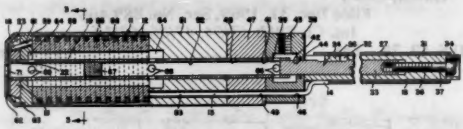
3,599,460
METAL-TREATING PROCESS AND APPARATUS
Eugene F. Finkin, 817 Second St. Apt. 106, Santa Monica, Calif.
Filed May 22, 1968, Ser. No. 731,098
Int. Cl. C21d 7/06
U.S. Cl. 72—53 8 Claims



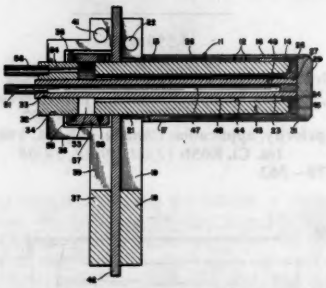

A system is disclosed for processing metallic members, to accomplish residual compressive stresses in surfaces thereof. It has been discovered that the provision of a defined fluid film over a metal member, while the member undergoes surface cold working (as by peening) accomplishes more effective peening without substantial attendant surface damage. This unexpected improvement stems from the use of a fluid having a pressure coefficient of viscosity which is above a critical level and as somewhat related to the modulus of elasticity of the metal undergoing surface treatment. Specifically, for example, in peening steel, a fluid is required having a pressure coefficient of viscosity which is substantially at least $7 \times 10^{35}$ p.s.i. $^{31}$. As a specific example of such a fluid, mineral oil may be employed along with oxidation inhibitors and other additives.

3,599,461
ELECTROMAGNETIC FORMING ELEMENT
Jaromir Astl, Solana Beach, Calif., assignor to Gulf Oil Corporation
Filed Nov. 21, 1968, Ser. No. 777,640
Int. Cl. B21d 26/14
U.S. Cl. 72—56 7 Claims

A forming element is described for use in magnetic forming apparatus. The forming element includes a conductor and a support member comprised of ceramic material. The support member, in addition to supporting the conductor, affords a vehicle for conducting heat from the conductor.

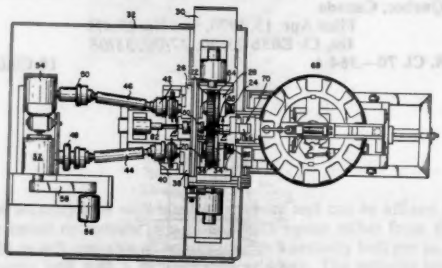


3,599,462
CERAMIC CORE ELECTROMAGNETIC FORMING COIL
James A. Kline, and Paul Wildi, both of San Diego, Calif., assignors to Gulf Oil Corporation
Filed Nov. 25, 1968, Ser. No. 778,675
Int. Cl. B21d 26/14
U.S. Cl. 72—56 8 Claims



A forming element is described for use in magnetic forming apparatus. The forming element includes a conductor and a support member comprised of ceramic material. The support member, in addition to supporting the conductor, affords a vehicle for conducting heat from the conductor.

3,599,463
GEAR ROLLING
Harold R. Sennstrom, Waynesboro, and John Leonard, Jr., Fayetteville, both of, Pa., assignors to Teledyne Mid-America Corporation, Los Angeles, Calif.
Filed Dec. 10, 1968, Ser. No. 782,605
Int. Cl. B21h 5/02
U.S. Cl. 72—108 5 Claims



Method and apparatus for forming or finishing gear teeth on a workpiece and particularly for establishing on the workpiece a series of gear teeth formed on a pitch circle essentially concentric with the axis of a central bore in the workpiece. The workpiece is rotated between a pair of forming dies having peripheral gear-forming profiles. Guide surfaces

essentially on the pitch circle of the profiles on the dies which cooperates with a guide surface disposed essentially at the intended pitch circle of the gear teeth on the workpiece are brought together under pressure while the profiles on said dies are in rolling engagement with the gear teeth on said workpiece.

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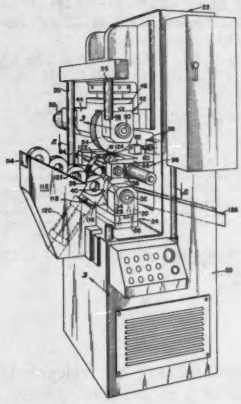
**3,599,464**

**APPARATUS FOR ROLL FORMING WORKPIECES**

**John E. Leonard, Jr., and Harold R. Sennstrom, both of Waynesboro, Pa., assignors to Teledyne, Inc., Los Angeles, Calif.**

**Filed Apr. 21, 1969, Ser. No. 817,669**
**Int. Cl. B21h** *5/02*
**U.S. Cl. 72—102** **5 Claims**



Apparatus for forming toothed workpieces by rolling them in high pressure contact with a single forming die, the workpieces being held in precise relation with the die during at least the final stage of the rolling operation by locating members associated, respectively, with the workpiece and the basic machine, the locating members being in rolling contact during at least the final stages of the rolling operation.

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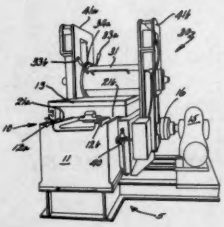
**3,599,465**

**METHOD AND APPARATUS FOR FORMING PATTERNS IN METAL PANELS**

**Paul A. Chenevier, Sydney, New South Wales, Australia, assignor to Aluminum Textures, Inc., Grand Rapids, Mich.**

**Filed Apr. 17, 1969, Ser. No. 816,900**
**Int. Cl. B21b**
**U.S. Cl. 72—207** **22 Claims**



A machine and a method for embossing sheet aluminum in which an embossing die having a pattern or design formed by etching or machining is placed on a movable table, a sheet of aluminum is placed on the embossing die, and the die and sheet of aluminum is progressivley compressed by rolling over said sheet of aluminum a large, cylindrical compression roller; then the embossed sheet of aluminum is distressed in curving and straightening rollers.

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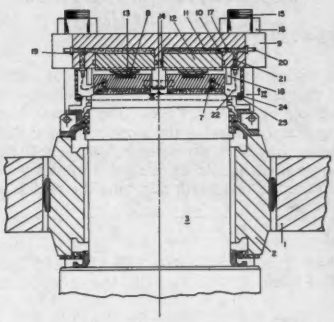
**3,599,466**

**METHOD OF AND APPARATUS FOR BENDING THE BACKING-UP ROLLS OF FOUR-HIGH ROLLING MILLS AND THE WORK ROLLS OF TWO-HIGH ROLLING MILLS**

**Lucien Diolot, Neuilly, France, assignor to Societe Nouvelle Spidem, Paris, France**

**Filed Oct. 10, 1968, Ser. No. 766,601**
**Claims priority, application France, Oct. 10, 1967, 123961**
**Int. Cl. B21b** *31/32*
**U.S. Cl. 72—245** **9 Claims**



The invention relates to a rolling mill construction in which a roll is arranged to have pressure applied to the oppositely disposed end faces thereof through pressure-operated devices so that it may be bent about its longitudinal axis.

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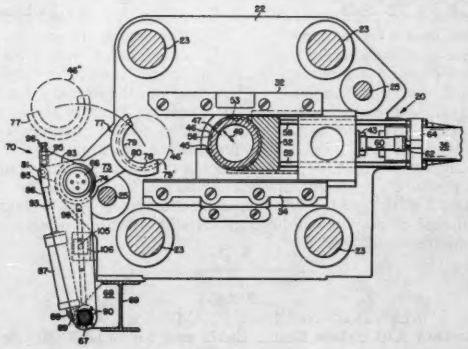
**3,599,467**

**DIE-CHANGING MECHANISM FOR AN EXTRUSION PRESS**

**Robert K. Valks, Penfield, N.Y., assignor to Farrel Corporation, Rochester, N.Y.**

**Filed Sept. 24, 1968, Ser. No. 762,032**
**Int. Cl. B21c** *23/00*
**U.S. Cl. 72—263** **5 Claims**



The die is held in axial alignment with the billet container during extrusion by a reciprocable die slide and a cooperating locking member. The die slide has a U-shaped pocket in one end for releasably holding the die carrier and its support-

ing bolster. The locking member is adapted to engage in a peripheral groove in the die carrier. To change a die, the locking member is disengaged and the die slide is moved laterally to a position where a pivotable receptacle can engage the carrier. The receptacle is then pivoted to lift the carrier out of the pocket in the slide, and swing it to a position where the carrier and die can readily be lifted out of the receptacle. For greater convenience two receptacles may be provided that are movable axially along their common pivotal axis so that a new die can be loaded in one receptacle while the previously used die is being removed from the other receptacle.

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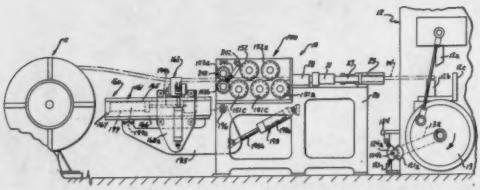
**3,599,468**

**WIRE DRAWING AND FEEDING APPARATUS**

**Richard A. Alcock; Robert B. Johnston, and Robert M. Guthrie, all of Rockford, Ill., assignors to Fastener Engineers, Inc., Rockford, Ill.**

**Filed Apr. 17, 1969, Ser. No. 816,908**
**Int. Cl. B21c** *1/28*
**U.S. Cl. 72—287** **10 Claims**



An hydraulically operated wire drawing and feeding apparatus having stationary draw grippers for gripping and holding the wire during a draw stroke, a movable wire-drawing die which is hydraulically actuated to draw a section of wire during a draw stroke of one hydraulic actuator, and stock feed grippers mounted for movement with the draw die to feed a section of drawn wire during a return stroke of the hydraulic actuator, in which fluid under relatively high pressure is supplied to the hydraulic actuator during the drawing stroke and fluid under a relatively low pressure is supplied to the hydraulic actuator during the feed stroke.

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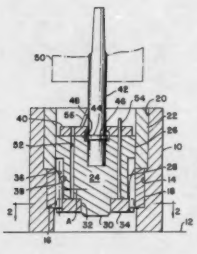
**3,599,469**

**APPARATUS FOR FORMING GEARS**

**Arthur B. Bassoff, Oak Park, Mich., assignor to Lear Siegler, Inc., Santa Monica, Calif.**

**Filed Aug. 19, 1968, Ser. No. 753,661**
**Int. Cl. B21h** *5/00*
**U.S. Cl. 72—343** **2 Claims**



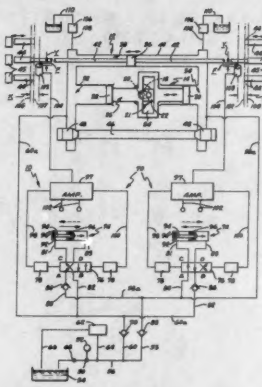
Method and apparatus for forming a gear from a cylindrical blank by forcing it through a circular-toothed die. The ends of the teeth of the die are tapered to facilitate displacement of metal. The blank is subjected to a multiplicity of rapid impacts by means equivalent to an air hammer.

**3,599,470**

**CONTROL SYSTEM FOR CONTAINER MANUFACTURING APPARATUS**

**A. Dean Smith a.k.a. Arthur Dean Smith, San Lorenzo, and Fred R. Waechter, Oakland both of, Calif., assignors to Kaiser Aluminum & Chemical Corporation, Oakland, Calif.**

**Filed Sept. 22, 1969, Ser. No. 859,997**
**Int. Cl. B21d** *22/20;* **B21j** *7/12*
**U.S. Cl. 72—349** **16 Claims**



Improved device for sensing and replenishing fluid losses in selected portions of a closed fluid driving circuit within which a piston is mounted, said piston having at least one punch means attached to each side thereof so as to effectively regulate the amount of travel of the piston in either direction at all times as well as the punches attached thereto.

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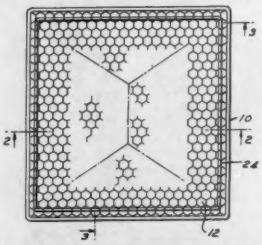
**3,599,471**

**EXPLOSIVE CAPPING FOR HEX DIES**

**Foster E. Whitacre, Farmington, Mich., assignor to Ford Motor Company, Dearborn, Mich.**

**Filed Nov. 21, 1969, Ser. No. 878,719**
**Int. Cl. B21j** *13/02*
**U.S. Cl. 72—414** **3 Claims**



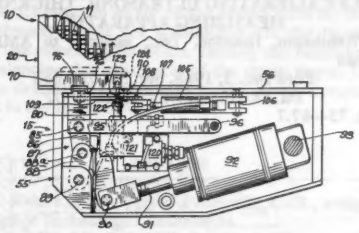
An incremental die construction comprising individual rod increments that are premachined and arranged in registry, one end of each rod forming an increment of a precalibrated surface contour, and a metal cap bonded to the ends of the rods over which sheet metal may be drawn during metal-forming operations.

3,599,472

## MAGAZINE AND CRIMPING MACHINE FOR TUBULAR ELECTRICAL CONNECTORS

Peter K. Koletsos, Schaumburg, and Robert H. Dawson, Lake Bluff, both of, Ill., assignors to Reliable Electric Company, Franklin Park, Ill.

Filed May 26, 1969, Ser. No. 827,606
Int. Cl. B21d *43/20*; H01r ; B23q *23/10*
U.S. Cl. 72—424 11 Claims



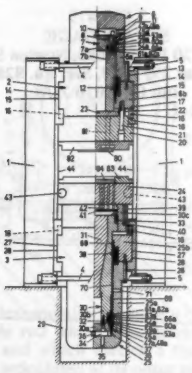
A magazine containing a commercial quantity of tubular communications electrical connectors, for example, 600 connectors, the magazine having a plurality of side-by-side passageways each containing a stack of connectors spring biased toward a discharge end of the passageway. The magazine functions with a crimping machine, and the two have cooperating mounting, guiding and indexing means so that the magazine may be mounted on and moved endwise in indexing manner with respect to the machine in order to bring a side-by-side pair of connector stacks in the magazine to a crimping station in the machine. A movable shuttle plate in the machine ejects a pair of connectors laterally from the pair of stacks at the crimping station, and locates them more or less rigidly between two anvils, one stationary and the other movable. Conductors are inserted manually into each connector, after which the movable anvil is actuated to perform a crimping operation on the pair of connectors between the anvils, thereby securing the inserted conductors in place. The movable anvil and shuttle plate operate in timed sequence in the operating cycle of the machine, and between crimping operations the crimped connectors are ejected and a new pair of connectors are positioned in the space between the anvils in readiness for the next conductor-inserting and crimping operations.

3,599,473

## STAMPING PRESS

Walter Wanner, Romanshorn, and Heinz Lampert, Buchs, both of, Switzerland, assignors to Hydrel A.G., Romanshorn, Switzerland

Filed Apr. 30, 1969, Ser. No. 820,497
Claims priority, application Switzerland, May 2, 1968, 6530/68
Int. Cl. B21j *13/04*
U.S. Cl. 72—455 13 Claims



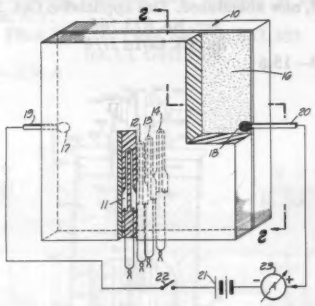
Press includes two subunits incorporating each a cylinder, piston, and a tool holder and independently removable from the press frame by removing tension bolts and knocking out supporting wedges.

3,599,474

## SELF-CALIBRATING HEAT FLUX TRANSDUCER

Ronald E. Brown, Altadena, and David R. Garfinkle, Sherman Oaks, both of, Calif., assignors to Whittaker Corporation

Filed July 25, 1969, Ser. No. 844,785
Int. Cl. G01k *7/02*, *19/00*
U.S. Cl. 73—1 F 5 Claims



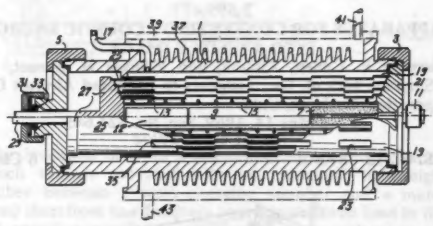
A heat flux transducer comprises a body of low heat conductivity material within which is embedded at least one pair of differential thermocouples. A sheet of uniform thickness and of conductive material is disposed between such thermocouples and has electrical connections thereto for passage of current through such sheet for calibration of such transducer.

3,599,475

## APPARATUS FOR THE STUDY OF THERMAL CYCLING OF ELEMENTS PARTICULARLY NUCLEAR REACTOR FUEL ELEMENTS

Claude Dubouch, Gonesse, and Maurice Petit, Manosque, both of, France, assignors to Commissariat A L'Energie Atomique, Paris, France

Filed Dec. 30, 1968, Ser. No. 787,679
Claims priority, application France, Jan. 5, 1968, 135 095
Int. Cl. G01n *25/00*
U.S. Cl. 73—15 5 Claims



The apparatus known as a "cycler" is made up of a gastight container in which a gas pressure can be maintained, a specimen-carrier fitted with thermocouples, a furnace surrounding said specimen-carrier and an internal heat-insulation system placed between the specimen-carrier and the internal wall of the container. The heat-insulation system is essentially made up of a stationary portion and a portion which

is capable of moving with respect to this latter. The stationary portion is constructed with metallic sheets provided with aligned windows and maintained in spaced relation. The movable portion is constructed with metallic sheets provided with windows which are identical with those of the stationary portion. And the sheets of the movable portion are interposed between the sheets of the stationary portion.

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**3,599,476**

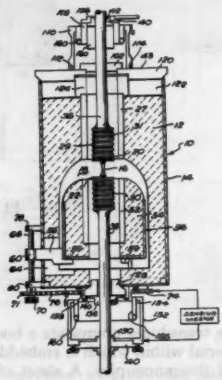
## THERMAL TESTING APPARATUS

**Robert B. Corbett, Mars, Pa., assignor to Corbett Associates, Inc., Mars, Pa.**

**Continuation-in-part of application Ser. No. 465,675, June 21, 1965, now abandoned. This application Oct. 31, 1969, Ser. No. 873,765**

**Int. Cl. G01n *3/18***

**U.S. Cl. 73—15.6** **21 Claims**



Apparatus for determining accurately the creep properties of material, such as hot tensile creep or creep rupture or stress relaxation. Precision is achieved by heating the specimen **16** uniformly, suppressing chimney effect, which would produce localized cooling of the specimen, and precisely aligning the specimen. Uniform heating is achieved by heating the specimen **16** indirectly through couplings **29** and **52** which are directly heated by heating elements **27** and **50** positionable to compensate for deformation of the specimen during stressing. Chimney effect is suppressed by heating and stressing in a chamber sealed at the ends (rolling loosely hanging seals **160** of high temperature-resisting, pliable collapsible membranes). These seals are prevented from collapsing by the pressure within the specimen chamber **10**. Alignment is effected by suspending the specimen **16** from couplings **38** including bearings so that the specimen is suspended from the bearings and not from threads **84**.

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**3,599,477**

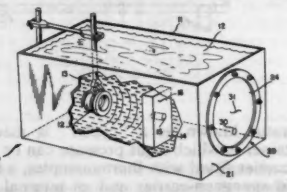
## APPARATUS FOR CONVERTING ACOUSTIC ENERGY INTO A VISIBLE IMAGE

**Sherman E. Cohen, Atlanta, and William H. Sproat, Sr., Smyrna, both of, Ga., assignors to Lockheed Aircraft Corporation, Burbank, Calif.**

**Filed May 14, 1969, Ser. No. 824,645**

**Int. Cl. G01n *29/04***

**U.S. Cl. 73—67.5 R** **8 Claims**



Apparatus for converting information in the acoustic domain into visible patterns. Acoustic energy is conducted through a wave-transmitting medium to impinge on an absorptive layer which converts the acoustic energy into thermal energy. The thermal energy is transmitted to a layer of a suitable thermochromic substance such as cholesteric liquid crystals, so that the thermochromic layer undergoes a characteristic color change corresponding to the intensity and the location of the wave of vibratory energy.

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**3,599,478**

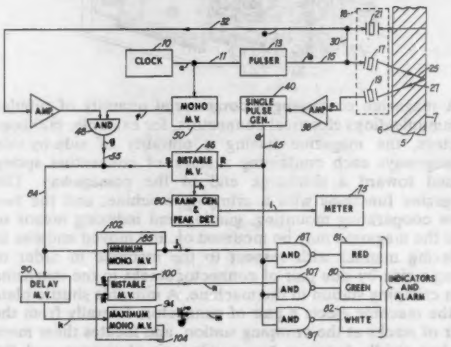
## SELF-CALIBRATING ULTRASONIC THICKNESS-MEASURING APPARATUS

**Hillel Weinbaum, Houston, Tex., assignor to AMF Incorporated**

**Filed Dec. 3, 1968, Ser. No. 780,663**

**Int. Cl. G01n *29/04*; G01b *17/02***

**U.S. Cl. 73—67.7** **3 Claims**




Pulsed ultrasonic thickness-measuring apparatus utilizing three ultrasonic transducers equally spaced from the adjacent surface of an object whose thickness is to be measured. Two transducers function as conventional transmitter and receiver to direct pulses of ultrasonic energy into the object and receive energy reflected from the far surface of the object or from a defect within the object. The third transducer is a transceiver that directs pulses of ultrasonic energy onto the adjacent surface of the object and receives reflections therefrom. A reflection received by the third transducers commences a time measuring operation indicating thickness of the object, or location of defect, as measured by the first two transducers. Use of a third transducer eliminates from timing operation the transit time of ultrasonic energy from transmitter transducer to adjacent surface, and from said surface to receiver transducer, thereby providing a measure only of thickness of object.

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**3,599,479**

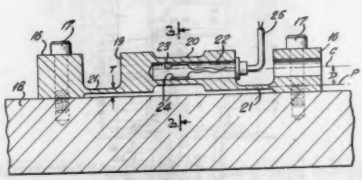
## STRAIN GAGE

**Ali Umit Kutsay, 3520 Lewis Road, Newton Square, Pa.**

**Filed May 29, 1969, Ser. No. 828,873**

**Int. Cl. G01b *7/18***

**U.S. Cl. 73—88.5 R** **8 Claims**



The probe unit includes a small central gaging beam portion, spaced end blocks adapted to be bolted or otherwise

clamped to the structure to be tested, and hinge plate portions connecting the blocks to the central portion in planes offset from the axis of the gaging beam. The hinge plates are relatively thin, and hence flexible, in the direction of the clamping attachment pressures, relieving the gaging beam of and significant initial bending stress in case of misalignment of the attaching surfaces. Electrical strain gages are bonded to the beam, preferably internally, in respectively outwardly and inwardly spaced relation to the beam's axis in the direction of the latter's offset from the plane of the connecting plates. Changes in strain of the tested member between the attachment blocks are transmitted via the blocks and plates to the offset gaging beam, causing the beam to bend, thus unbalancing the resistances of the strain gages. The imbalance is detected by calibrated means, giving a measure of the stress in the tested structure.

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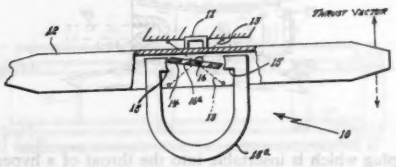
**3,599,480**
**THRUST STAND**
**Walter F. Krieve, Palos Verdes Peninsula, Calif., assignor to TRW Space Technology Laboratories**
**Filed Jan. 29, 1970, Ser. No. 6,873**
**Int. Cl. G01m *15/00***
**U.S. Cl. 73—117.4** **5 Claims**




The propulsion device or thruster is mounted on the balance beam so that the force it produces is normal to the plane of the beam and pivot line of the suspension system. The force will cause the beam to rotate about the pivot line of the crossed flexures, producing an electrical output which is proportional to the impulse produced during the thrust pulse. The time rate of change of the electrical output is proportional to the instantaneous thrust.

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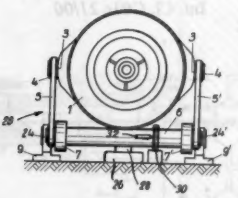
**3,599,481**
**TORQUE SUPPORT FOR A TRANSMISSION**
**Karl Grimpe, Mulheim/Ruhr-Speldorf, Germany, assignor to Demag Aktiengesellschaft, Duisburg, Germany**
**Filed Mar. 31, 1970, Ser. No. 24,267**
**Claims priority, application Germany, Apr. 12, 1969, P 19 18 689.1**
**Int. Cl. G01l *3/02***
**U.S. Cl. 73—136 R** **10 Claims**



A support for a transmission includes a crossmember in the form of a rotatable rod which is supported at each end on bearing pedestals and which carries a crank lever adjacent each end which is articulated at its outer end to a torque support in the form of a link member. The link member is pivotally connected at its upper end to a respective side of a housing for a transmission for a main shaft with which it is associated. The torque supports on each side of the housing provides means for supporting the transmission centrally over the rotatable rod and the rod may be additionally supported such as by a spring or a fluid pressure cylinder. The torsion stressed rod for the two torque supports may serve as a holder and as a measuring means for the measurement of the torque which is developed at the transmission housing by the associated shaft.

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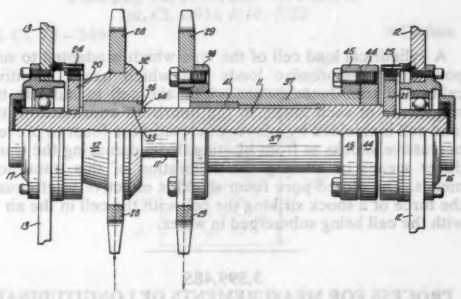
**3,599,482**
**HEAVY DUTY DYNAMIC TORQUE MEASURING DEVICE**
**Herbert A. Rundell, Houston, Tex., assignor to Texaco Inc., New York, N.Y.**
**Filed June 16, 1969, Ser. No. 833,383**
**Int. Cl. G01l *3/04***
**U.S. Cl. 73—136 A** **5 Claims**



A heavy duty coupling mechanism for use in measuring high torque. It includes a torque shaft with dynamic torque measuring instruments mounted thereon spaced longitudinally apart along the shaft. There is a pair of sprockets at one end of the torque shaft. One sprocket is solidly mounted on the shaft, and the other is mounted for free relative rotation at that end of the shaft but with heavy-duty connection to the other end.

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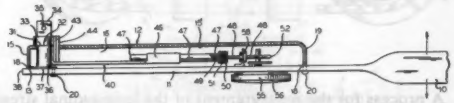
**3,599,483**
**TORQUE WRENCH TRANSLATING DEVICES**
**Kenneth R. Larson, Des Plaines, Ill., assignor to Snap-on Tools Corporation, Kenosha, Wis.**
**Filed June 7, 1968, Ser. No. 735,401**
**Int. Cl. G01l *5/24***
**U.S. Cl. 73—139** **6 Claims**

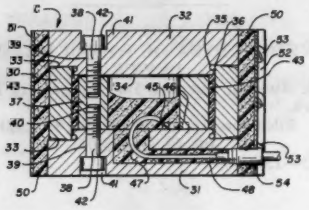


The invention involves a self-contained torque-measuring wrench that is provided with an elongated lightweight member between a work-engaging member and a meter spaced therefrom to effectively translate the twist load in the work-engaging member to a calibrated meter with minimum friction and without variation for accurate meter measurement commensurate with the manually applied work-engaging turning load irrespective of whether or not frictional variations should develop owing to departures from the prescribed manual application of the turning force which may inadvertently occur. This is accomplished with an improved twist-translating arm and mount therefor which is subject to minimum frictional displacement and negligible deflection responses even though the applied directional manual force for fastener turning is not entirely in the plane of fastener rotation therewith.

## 3,599,484
## SHIELDED LOAD CELL

Donald R. Stewart, and Howard B. Dutro, both of Denver, Colo., assignors to Teledyne Industries, Inc., Los Angeles, Calif.

Filed Dec. 18, 1968, Ser. No. 784,850
Int. Cl. G01e 5/12
U.S. Cl. 73—141 A 4 Claims

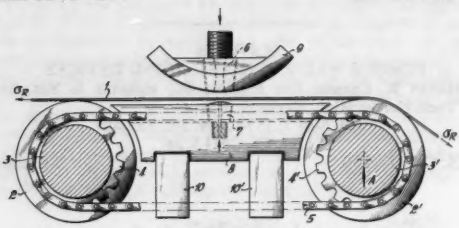


A cylindrical load cell of the type which is adapted to support large compressive loads and which has a sensitive, calibrated transducer means within the cell to indicate the magnitude of such loads. In the improved construction, the load cell is shielded by a layer of closed-pore foam to prevent percussive shocks as from blasting, from damaging the transducer means or altering the calibration of this transducer means. The closed-pore foam shield is effective to attenuate the force of a shock striking the cell with the cell in the air or with the cell being submerged in water.

## 3,599,485
## PROCESS FOR MEASUREMENTS OF LONGITUDINAL STRESSES IN METAL BANDS UNDER LONGITUDINAL TENSION

Wolfgang Muhlberg, Gertrudisstrasse 9, Krefeld-Bockum, Germany

Continuation of application Ser. No. 603,377, Dec. 20, 1966. This application June 26, 1969, Ser. No. 853,577. Claims priority, application Germany, Dec. 22, 1965, Sept. 6, 1966, M 67,742, M 70,826
Int. Cl. G011 5/04
U.S. Cl. 73—144 4 Claims



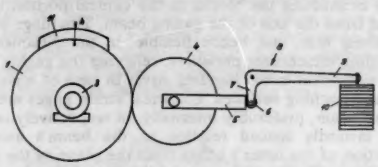
A process for the measurement of the longitudinal stresses prevailing across metal bands which are under longitudinal tension, by subjecting the bands to transverse deflection at different spots and determining the magnitude of the deflection which are a direct measure of the tensions within the different zones. The deflection is produced by mechanical means, i.e., a knocking device, gas or liquid bursts, acoustical or magneto-electrical means.

## 3,599,486
## TIRE SHOULDER TESTING MACHINE

Franz Pernau, Vienna, and Karl Klerr, Mollersdorf, both of, Austria, assignors to Semperit Osterreichisk-Amerikanische Gummiwerke Aktiengesellschaft

Filed Sept. 3, 1969, Ser. No. 854,945
Int. Cl. G01m 17/02
U.S. Cl. 73—146 6 Claims

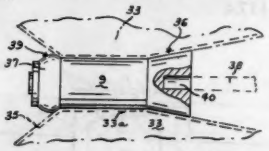
A machine for testing the shoulder tensile strength of a pneumatic tire has a revolving drum on which the tire rolls, and an obstacle that is mounted on the drum and projects into the region of the tire shoulder to simulate the mounting of the tire on a curbstone.



## 3,599,487
## HYPERSONIC WIND TUNNEL THROAT PLUG

Anthony J. Brigalli, Fairborn, Ohio, assignor to The United States of America as represented by the Secretary of the United States Air Force

Filed Oct. 27, 1969, Ser. No. 869,674
Int. Cl. G01m 9/00
U.S. Cl. 73—147 4 Claims

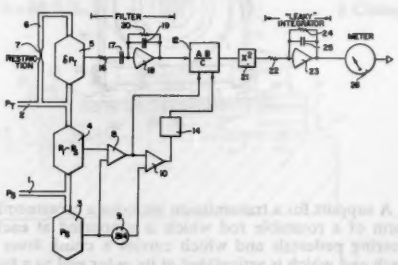


A plug which is insertable into the throat of a hypersonic wind tunnel and is yieldably retained therein, and initially completely isolates any relative pressure in a wind tunnel pebble storage heater for supplying heated air, from a vacuum being built up in the wind tunnel test leg section. The plug is insertable into the wind tunnel throat through the wind tunnel nozzle exit area section and comprises a body snugly fitting the throat having an annular resilient sealing and retaining lip which engages the "upstream" end of the throat section to yieldably retain the plug in place in sealed relation against a "hard" vacuum being built up "downstream" in the diffuser and test section of the tunnel until a predetermined pressure differential from the pebble storage heater on the upstream end of the plug builds up and blows the plug out of the throat and into the diffuser section due to the pressure of the heated air from the pebble storage heater.

## 3,599,488
## APPARATUS FOR MEASURING AIR TURBULENCE ENCOUNTERED BY AIRCRAFT

Graeme K. Mather, and Donald F. Daw, both of Ottawa, Ontario, Canada, assignors to Canadian Patents and Development Limited, Ottawa, Ontario, Canada

Filed Mar. 9, 1970, Ser. No. 17,758
Int. Cl. G01c 21/00
U.S. Cl. 73—178 5 Claims



Air turbulence encountered by an aircraft is measured according to the equation

$$I \alpha \frac{P_T \delta P_T}{(P_T - K.Ps)^2},$$

wherein, with respect to turbulent air through which an aircraft is passing, $I$ is a measure of the intensity of the longitudinal component of the turbulence, $P_s$ is the static air pressure, $P_T$ is the total air pressure, $\delta P_T$ is the fluctuation of the total air pressure, and $K$ is a function of the slope of a linear approximation to a graph of actual values for $P_s/P_T$ versus $V/T_T$, where $V$ is the average true airspeed and $T_T$ is the total absolute temperature. A system for render a solution to the equation includes air pressure transducers on the aircraft for providing electrical signals corresponding to $P_T \delta P_T/(P_T - KP_s)^2$. The electrical signals corresponding to $P_T \delta P_T/(P_T - KP_s)^2$ are applied to the input of a leaky integrator circuit to render an average electrical signal indicative of an approximate measure of turbulence in terms of wind velocity.

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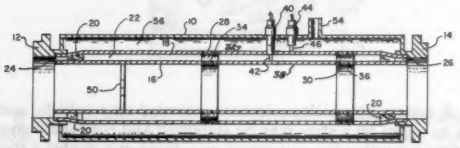
**3,599,489**

## NUCLEAR MASS FLOWMETER

**Thomas N. Marshall, Jr., Huntsville, Ala., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration**

**Filed Mar. 24, 1970, Ser. No. 22,320**
**Int. Cl. G01f 1/00**
**U.S. Cl. 73—194 F** **8 Claims**



A flowmeter utilizing a Beta source positioned upstream of a cylindrical capacitor formed by two spaced-apart concentric cylindrical sections. The concentric cylindrical sections form the capacitor electrodes and they are a part of two concentric, inner and outer, tubular members which are mounted in an outer housing that is adapted to be connected into a flow line so that fluid flows through both the inner and outer tubular members. The capacitor electrodes are insulated from the tubular members by means of dielectric ring members connected therebetween. Means are provided for detecting any potential difference between the two electrodes and for evacuating the space between the outer tubular member and the housing.

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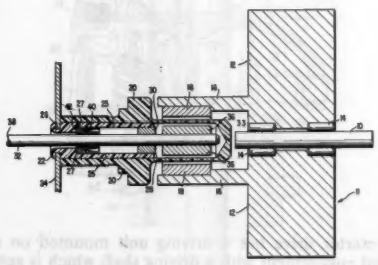
**3,599,490**

## SAFETY SEAL FOR DIRECT READING FLOW METER

**Robert G. Love, and Paul A. Moore, both of Duncan, Okla., assignors to Halliburton Company, Duncan, Okla.**

**Filed July 11, 1969, Ser. No. 840,932**
**Int. Cl. G01f 15/10; F17j 15/32**
**U.S. Cl. 73—272 R** **6 Claims**



A seal is provided having a resilient, hollow, generally cylindrical body. An annular V-shaped groove extends longitudinally within the cylindrical body from one axial end of the seal through approximately two-thirds of the length thereof. An annular bead is formed on the inner cylindrical surface of the seal adjacent the grooved axial end. The inner cylindrical surface extends generally parallel to the axis of the overall configuration of the seal. The outer cylindrical surface of the seal also extends parallel with the axis from the nongrooved axial end to a point along the length of the seal midway between the two axial ends. From this midpoint to the grooved axial end, the outer cylindrical surface diverges from the axis of the seal. When the seal is disposed about a rotatable shaft, the only friction between the two is generated along a circumferential contact line defined by the outer periphery of the annular bead. A pressure differential applied across the seal forces the sides of the groove apart and urges a substantial portion of the inner surface of the seal against the shaft so as to apply a braking force thereto. The fluid tightness of the seal is directly proportional to the pressure differential applied thereacross.

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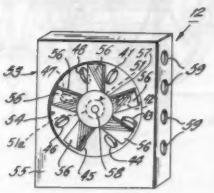
**3,599,491**

## QUICK RESPONSE RECORDING THERMOMETER

**Donald I. Bohn, 1501 N. Miracle Mill, Tucson, Ariz.**

**Filed July 16, 1969, Ser. No. 842,115**
**Int. Cl. G01k 1/16, 7/22**
**U.S. Cl. 73—349** **8 Claims**



The galvanometer of an electrically driven recorder is connected to the output terminal of a bridge circuit, one leg of which consists of a plurality of thin disk temperature-sensing thermistors, disposed in a circular array positioned at the intake side of an axial blower in the airstream produced thereby. The thermistor faces are generally parallel to the direction of the airflow, so that the temperature of the thermistors changes rapidly and closely follows temperature changes of air impinging thereon.

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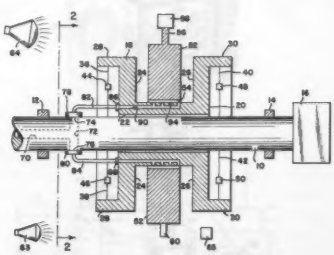
**3,599,492**

## COAXIAL GRAVITY METER

**Henry P. Kalmus, and Billy M. Horton, both of Washington, D.C.**

**Filed Sept. 2, 1969, Ser. No. 854,472**
**Int. Cl. G01v 7/00**
**U.S. Cl. 73—382** **8 Claims**



A gravity meter having two masses which are both fixed to independently rotate about the same axis. Strain gauges are connected from one mass to its center of rotation to detect centrifugal and gravitational forces acting on the mass and the angular velocities of both masses are adjusted to provide an AC null in the output of the strain gauges. When such a null is attained, the centrifugal force developed by the masses balances the force due to gravity. Since the angular velocities

of the masses are directly related to the centrifugal force, a measurement of the angular velocity provides a measure of gravity.

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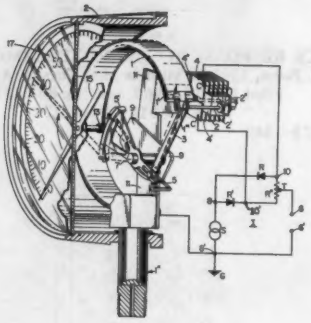
**3,599,493**
**PRESSURE TRANSDUCER APPARATUS**
Paul Bert Thomas, Canton, Mass., assignor to Joseph Kaye & Company, Inc., Cambridge, Mass.
Filed Aug. 21, 1969, Ser. No. 852,048
Int. Cl. G01l *9/12*
U.S. Cl. 73—398 C 8 Claims



This disclosure deals with pressure transducer apparatus particularly adapted for connection with Bourdon tube sensors, and preferably embodying a variable impedance element coupled with such tube sensors and connected in a bridge-type circuit for producing electrical signals corresponding to the pressure sensed by the sensors.

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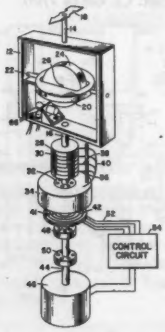
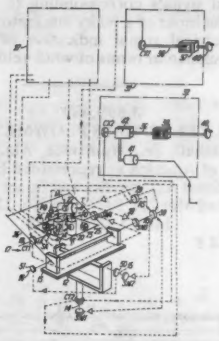
**3,599,494**
**GYROSCOPE PICK-OFF AND TORQUER DEVICE**
Henry P. Lichte, Jr., 4130 Villanova, Houston, Tex.
Filed July 10, 1968, Ser. No. 743,681
Int. Cl. G01c *19/28*
U.S. Cl. 74—5.6 14 Claims




A torqueing motor for applying a restorative force to the gimbal of a gyro in order to maintain the rotor housing of the gyro perpendicular to the outer gimbal. A light sensitive device is utilized for transmitting indications of rotor tilt to the restoring motor with the restoring torque being applied to the vertical bearings of the outer gimbal by means of slip rings and brushes.

**3,599,495**
**SYSTEMS FOR GYROSCOPICALLY STABILIZING AND CONTROLLING EQUIPMENT MOUNTED ON VEHICLES**
Kenneth Robson Brown, Midlothian; Charles Ian Crawford, Edinburgh, and Erskine Robert Reid, Midlothian, all of, Scotland, assignors to Ferranti, Limited
Filed Sept. 23, 1969, Ser. No. 860,277
Claims priority, application Great Britain, Sept. 26, 1968, 45734/68
Int. Cl. G01c *19/32*
U.S. Cl. 74—5.34 8 Claims



A system by which equipment mounted on a vehicle, such as an aerial on a ship, may be stabilized and controlled comprises mounting the equipment on a three-axis gimbal s stem with the elevation axis comprising the inner gimbal axis, providing on the equipment a control and stabilizing unit including a gyroscopically stabilized platform which defines a vertical reference axis, the unit being arranged to drive the servomechanisms associated with the gimbal axes to stabilize and control the equipment, and the stabilized platform being tended to be rotated by a fourth, precision servomechanism about an axis parallel to the inner gimbal axis in response to elevation positional information signals.

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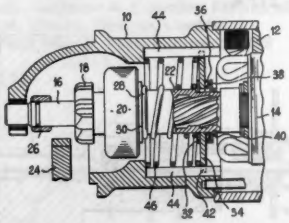
**3,599,496**
**STARTER DRIVE**
Pierre Toulier, Ville D'Avray, France, assignor to Societe Anonyme D.B.A.
Filed Sept. 25, 1969, Ser. No. 861,099
Claims priority, application France, Sept. 27, 1968, Dec. 4, 1968, 167,901;176,562
Int. Cl. F02n *11/00*
U.S. Cl. 74—7 13 Claims



The starter drive has a driving unit mounted on and in threaded engagement with a driving shaft which is automatically advanced into driving engagement with a part of the engine as a result of said threaded engagement when it is retarded relatively to rotation of the driving shaft by a braking device. The latter comprises a nonrotatable axially movable friction plate slipped on the driving unit and frictionally engaged by friction washer means driven in rotation by the latter and resiliently urged against said plate, resilient return

means opposing the advance of said driving unit. Said resilient return means consist of a spring means compressed between the friction plate and the housing structure, said friction plate being squeezed between said friction washer means and a thrust ball bearing supporting the load of said spring means.

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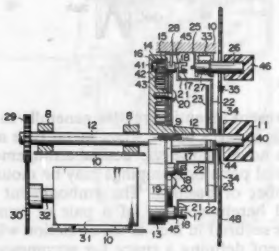
**3,599,497**
**CHANNEL SELECTING DEVICES**

**Akira Fukumitsu, Kawasaki, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan**

**Filed May 6, 1970, Ser. No. 35,079**
**Claims priority, application Japan, May 7, 1969, 44/34515**
**Int. Cl. F16h** *35/18*
**U.S. Cl. 74—10.41** **9 Claims**



A channel-selecting device comprises a channel selector shaft, a support mounted on the channel selector shaft, a plurality of individually adjustable tuning elements mounted on the support concentrically with the selector shaft, a stop mechanism to arrest one of the elements, indicators connected to the elements, a channel dial connected to said channel selector shaft, a preset and fine-tuning mechanism to rotate said support while said channel-selecting elements are being arrested by said stop mechanism in order to preset said arrested elements to the desired channels and a tuner interlocked with the channel selector shaft.

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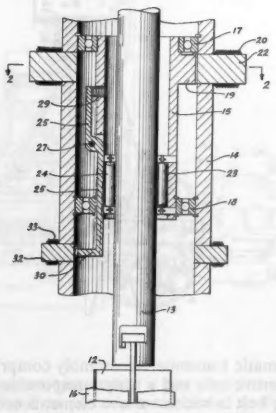
**3,599,498**
**CONTROL ROD DRIVE MECHANISM**

**Angelo J. Misenti, Simsbury, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.**

**Filed Apr. 15, 1969, Ser. No. 816,193**
**Int. Cl. F16h** *21/16*
**U.S. Cl. 74—25** **3 Claims**



In a nuclear reactor a cylindrical control rod extension is surrounded by a cylindrical form which contains three rollers. This cylindrical form is rotatably mounted within a surrounding pressure vessel and includes a rotor. A stator winding surrounding the pressure vessel effects rotation of the cylindrical form. The rollers are in pressure contact with the control rod extension and at a slight angle so that rotation of the cylindrical form effects longitudinal movement of the control rod. Operation of an electrical coil moves a magnetic arm releasing one of the rollers effecting scram of the reactor control rod.

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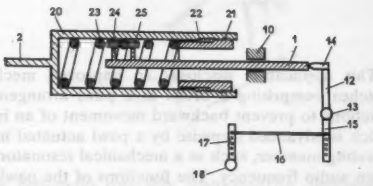
**3,599,499**
**CONTROL DEVICES**

**Francis Steiner, 10 rue des Chataigners, 91 Verriere Le Buisson, France**

**Filed Nov. 14, 1968, Ser. No. 775,882**
**Int. Cl. F16h** *27/02*
**U.S. Cl. 74—89.15** **8 Claims**



A control apparatus having an adjustable gain or transmission ratio. The apparatus has a controlling device which accepts an input quantity and a controlled or output device which produces an output quantity. A regulator is interposed between the controlling and the controlled devices. The regulator has an adjustable transmission ratio which is varied in response to the magnitude of the output quantity.

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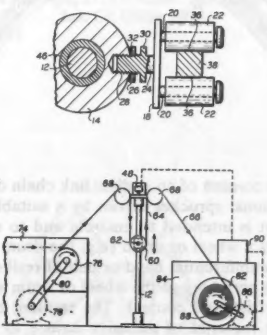
**3,599,500**
**ZERO BACKLASH, LOW-FRICTION LINEAR-ROTARY TRANSLATOR**

**Ben Bravin, 215 W. 88th St., New York, N.Y.**

**Filed June 25, 1969, Ser. No. 836,282**
**Int. Cl. F16h** *27/02, 1/8*
**U.S. Cl. 74—89.15** **7 Claims**

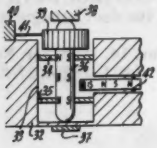


A linearly movable actuator contacts with flat faces on opposite sides of a shaft. The faces extend helically along the shaft. Axial movement of the actuator along the shaft causes the shaft to rotate, and the actuator can be adjusted into canted positions so that it contacts with the opposite sides of the shaft at the same time, thereby eliminating backlash from the system.

## 3,599,501
## PAWL ARRANGEMENT

Max Hetzel, Bienne, Switzerland, assignor to Centre Electronique Horloger S.A., Neuchatel, Switzerland

Filed Aug. 18, 1969, Ser. No. 850,885
Claims priority, application Switzerland, Aug. 19, 1968, 12454/68
Int. Cl. F16h 27/02; G04c 3/00
U.S. Cl. 74—142 27 Claims

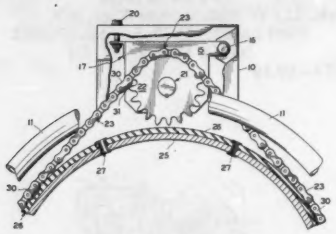


This application discloses an improved mechanism for watches comprising a brush in a pawl arrangement which functions to prevent backward movement of an index wheel which is advanced stepwise by a pawl actuated in turn by a vibrating member, such as a mechanical resonator, operating at an audio frequency. The functions of the pawl and brush can be reversed. The index wheel can be radially magnetized, or mounted on a radially magnetized arbor to provide magnetic coupling to a dial train.

## 3,599,502
## FRICTION CHAIN DRIVE

John T. Craft, Sturgis, S. Dak.; John D. Forbes, Overland Park, Kans., and Merle E. Vig, Mud Butte, S. Dak., assignors to Jolyn Corporation, Sturgis, S. Dak.

Filed Feb. 2, 1970, Ser. No. 7,588
Int. Cl. F16h 7/00, 15/00, 7/10
U.S. Cl. 74—219 5 Claims



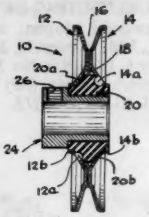
The device consists of an endless link chain drive rotatable by a conventional sprocket driven by a suitable motor. The chain element is intended to encircle and to drive a rotary object such as a wheel or drum (e.g. the drum of a concrete mixer). A circumferential band or belt of resilient material is applied to the periphery of the wheel or drum with which the chain makes frictional contact. The resilient belt is applied by a suitable material of adhesive nature to the wheel or drum to be driven. A tensioning device such as a tension bolt to adjust the spacing between the sprocket and drum, allows adjustment of the amount of frictional contact of the chain with respect to the belt. Spaced metallic feet carried by the chain may be employed to make contact with the belt.

The above arrangement allows for a desirable and adjustable amount of slippage between the driving and driven elements to prevent damage to the elements and their connections.

## 3,599,503
## SHEAVE CONSTRUCTION

Edward H. Schultz, Jrl, Chicago, Ill., assignor to Nagel-Chase Manufacturing Company, Chicago, Ill.

Filed Oct. 16, 1969, Ser. No. 866,894
Int. Cl. F16h 55/44
U.S. Cl. 74—230.8 8 Claims

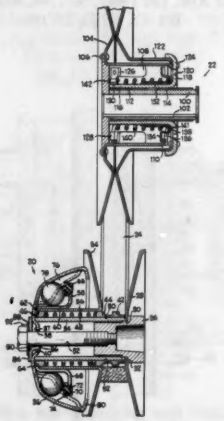


The present invention relates generally to improvements in pulleys or sheaves of the sheet metal type and more particularly to a novel and very practical arrangement whereby such sheet metal parts or stampings may be mounted upon a driving member or bushing. The embodiment of the invention disclosed herein consists of a pair of annular sheet metal members secured in face-to-face relation with the outer margins thereof defining a space for accommodating a belt and the inner margins defining a space for accommodating the outer periphery of the yieldable coupling collar. This collar may be made of suitable rubberlike yieldable material, such as Neoprene, and the outer periphery thereof is firmly impinged by the inner margins of the sheet metal members. The inner margin of the collar aggressively impinges or is bonded to the outer periphery of a driving member such as a bushing.

## 3,599,504
## AUTOMATIC TRANSMISSION

Charles F. Taylor, Boulder, Colo., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Feb. 2, 1970, Ser. No. 7,925
Int. Cl. F16h 55/22
U.S. Cl. 74—230.17 E 16 Claims



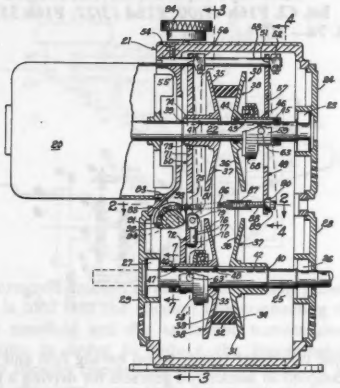
An automatic transmission assembly comprising a centrifugally responsive unit and a torque-responsive unit connected by a pulley belt in which various elements subjected to stress are constructed of wrought material for ease of manufacturing and for safety, the construction of the units being such to provide positive drive between a driven shaft and a driving shaft.

3,599,505

## VARIABLE SPEED PULLEY DRIVE

George H. Logan, Northbrook, and Claes L. Hultgren, Clarendon Hills, both of, Ill., assignors to Logan Engineering Co., Chicago, Ill.

Filed Aug. 19, 1969, Ser. No. 851,281
Int. Cl. F16h 55/22
U.S. Cl. 74—230.17 12 Claims



A variable speed power transmission which uses drive and driven pulley, each of which has an axially shiftable section to change the effective diameter thereof, the transmission having more uniform belt tension. Positive devices are provided for moving each shiftable pulley section toward its axially fixed section in place of the spring normally used on one of the pulley sections, and a single-control knob positions both shifting devices. The shifting devices comprise a rotatable cam and follower for each shiftable pulley section, with the followers actuating shift levers connected through a form of universal connection to said shiftable sections to relieve the pulleys of eccentric forces produced by the levers. Two forms of levers are described.

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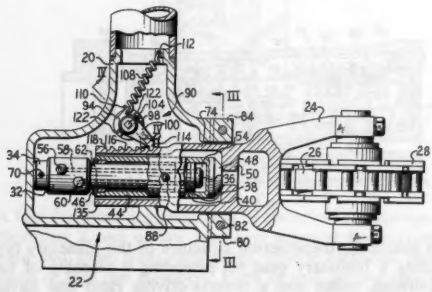
3,599,506

## CHAIN ADJUSTER WITH SELF-LOCKING MECHANISM

Gary P. Freese, Will County, Ill., assignor to Caperpillar Tractor Co., Peoria, Ill.

Filed Jan. 19, 1970, Ser. No. 3,791
Int. Cl. F16h 7/12; F01b 15/02, 7/20
U.S. Cl. 74—242.1 FP 7 Claims



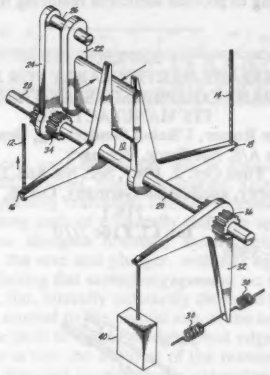
A hydraulic adjuster assembly is provided for the endless chain of an elevator to provide a means for easily adjusting the tension in the chain. The adjuster assembly is provided with a self-locking mechanical lock means which automatically prevents the transmission of forces in the elevator to the adjuster after an adjustment has been made.

3,599,507

## CABLE FAILURE COMPENSATOR

Alfred F. Exton, Issaquah, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed May 4, 1970, Ser. No. 34,011
Int. Cl. G05g 1/00
U.S. Cl. 74—469 5 Claims



A pair of bellcranks rotatably positioned for disposing a clamping force against each side of a bar. Control cables are connected to the bellcranks for moving the bellcranks about their axis of rotation and thereby transfer displacement to the bar. The bar is indirectly connected to an actuating member which in turn controls the positioning of an output means. The actuating member is rotatably positioned and has a lever which has opposing spring connections so that the actuating member positions itself about is rotational axis in a center or neutral position, which can be overcome by the driving force of the bar only. Cable failure which results in cable tension loss will remove the clamping force from the bellcranks holding the bar and thereby disconnect the bellcranks from the bar so that the actuating member will center itself automatically about its axis into the neutral position advocated by the opposing spring force means connected to the actuating member lever.

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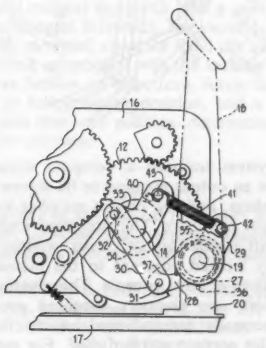
3,599,508

## POWER TRANSMISSION SYSTEM

Ray S. Richmond, Placitas, N. Mex., assignor to The Singer Company, New York, N.Y.

Filed Apr. 27, 1970, Ser. No. 32,016
Int. Cl. G05g 1/04
U.S. Cl. 74—491 9 Claims



An energy storage mechanism provides maximum torque near the rest end of the stroke of a crank arm in a drive

mechanism. A double extended arm is carried on one shaft controlled by the crank arm while a second double extended arm is carried by a driven shaft. A coil spring is supported between the two arms on one side of the axes of the two shafts while the other two opposed arms are connected by a link on the other side of the axes of the shafts. The one opposed, or moment, arm actuated by the crank arm is longer than the other so that the rocking of the crank arm preloads the coil spring to provide sufficient restoring torque.

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**3,599,509**

**CRANKSHAFT, PARTICULARLY FOR ENCASED REFRIGERANT COMPRESSORS, AND A METHOD FOR ITS MANUFACTURE**

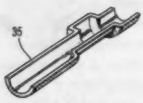
**Bendt Wegge Romer, Ulkebol Sonderborg, Denmark, assignor to Danfoss A/S, Nordborg, Denmark**

**Filed Oct. 2, 1969, Ser. No. 863,227**

**Claims priority, application Germany, Oct. 8, 1968, P 18 01 719.1**

**Int. Cl. F16c** *3/10*

**U.S. Cl. 74—598** **10 Claims**




The invention is a crankshaft made from two sheet metal stampings having longitudinally extending edges which are joined as by welding to form a unitary crankshaft.

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**3,599,510**

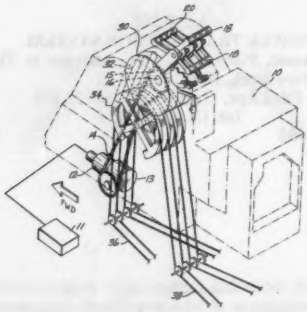
**CONTROLLED DEVICE COMPRISING ALTERNATE MANUAL OR POWER OPERATORS**

**John W. Scott, Sr., Canoga Park, Calif., and John A. Hockenson, Seattle, Wash., assignors to The Boeing Company, Seattle, Wash.**

**Filed Oct. 6, 1969, Ser. No. 866,791**

**Int. Cl. B64c** *13/04;* **F16d** *13/10*

**U.S. Cl. 74—625** **5 Claims**



A control system utilizing a compact clutch assembly which will allow an output member to be driven by either of two input members, and the output member to back drive one of said input members. The preferred embodiment involves an aircraft engine throttle control system which has a clutch assembly located adjacent to the manual operating levers in the pilot's control console. The clutch utilizes friction shoes which are pivotally mounted on the output member and normally spring biased into frictional contact with an autopilot servo-controlled disk. For manual operation, cam means are employed to lift the frictional contact with the servodisk for direct drive of the output members by a manual throttle lever. The clutch will allow manual override through slipping of the shoes in the event the cam means fails to function, and will similarly allow a back drive of the output member and the manual lever by feedback forces from a thrust reverser actuated mechanism.

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**3,599,511**

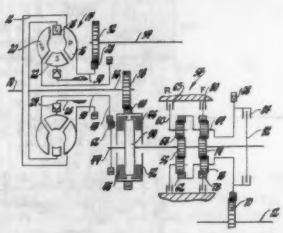
**TORQUE CONVERTER TRANSMISSION WITH FREEWHEEL FRICTION CLUTCH**

**John E. Storer, Jr., Indianapolis, Ind., assignor to General Motors Corporation, Detroit, Mich.**

**Filed Sept. 11, 1969, Ser. No. 856,985**

**Int. Cl. F16h** *47/00;* **F16d** *13/22;* **F16h** *55/18*

**U.S. Cl. 74—718** **10 Claims**



Torque converter transmission having first and second turbines coupled to associated gearsets for driving a range transmission through a power-combining drive shaft. There is a special freewheel friction clutch between the first turbine gearing and the drive shaft which is subjected to a clutch drag force exerted through a cam mechanism by a tickle spring so that the clutch can be fully engaged by the cam mechanism without lash for a first phase of converter operation. At a predetermined transmission speed ratio first turbine torque becomes negative, the cam mechanism releases the clutch and the second turbine overruns the first turbine. During this second phase of converter operation when only the second turbine is driving, centrifugal force reduces and finally cancels the tickle spring force to eliminate clutch drag. Clutch-engaging cam plates are inertia tickled during rapid speed reduction to exert a drag force on the clutch so that the device will reengage with no backlash when the first turbine provides drive torque.

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**3,599,512**

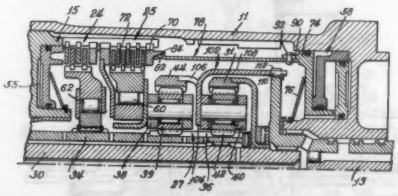
**TRANSMISSION MECHANISM**

**Robert W. Wayman, Bloomfield Hills, Mich., assignor to Borg-Warner Corporation, Chicago, Ill.**

**Filed July 29, 1969, Ser. No. 845,806**

**Int. Cl. F16h** *57/10;* **F16d** *51/00, 25/00*

**U.S. Cl. 74—763** **17 Claims**



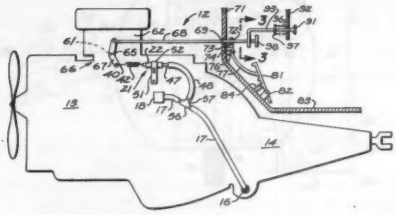
An automatic transmission structure of the planetary type including a planetary gear set providing a plurality of forward-driving ratios and a reverse-driving ratio and having remote means for applying a friction brake to establish one of the ratios, the remote means including an annular member extending from a hydraulic servomotor on one side of the planetary gear set to a friction brake mechanism on the other side of the planetary gear set so as to apply said friction brake remotely and further includes a sheet metal part interconnecting two elements of the planetary gear set and the output shaft of the transmission.

3,599,513

## VACUUM REGULATOR FOR ENGINE AUTOMATIC TRANSMISSION

David G. Buno, 6820 4th Ave., Rio Linda, Calif., and General C. Fletcher, 3630 Way Country Club, Sacramento, Calif.

Filed Sept. 16, 1969, Ser. No. 858,448
Int. Cl. B60k *13/02*
U.S. Cl. 74—877 4 Claims



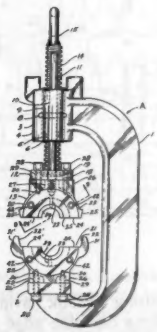
A predetermined amount of air at substantially atmospheric pressure is bled into the vacuum line connecting the engine intake manifold and the automatic transmission of a vehicle engine in order to reduce the transmission line vacuum and thereby compensate for many types of slips in transmission members, exemplary being the slips resulting from "varnished" or "glazed" clutch plates and bands. The corrective airflow is controlled by a valve operatively connected to the engine throttle, with valve movement arranged to be a function of throttle position.

3,599,514

## INSULATION REMOVAL TOOL

Theodore A. Fornkahl, 919 W. Douglas, Jacksonville, Ill.

Filed Oct. 15, 1969, Ser. No. 866,625
Int. Cl. H02g *1/12*
U.S. Cl. 81—9.5 R 4 Claims



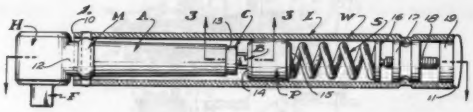
A tool for removing insulation of electrical conductors, incorporating a pair of jaw members adapted for movement toward and away from each other, cutting elements carried in each of said jaw members. Each of said cutting elements having a pair of arcuate cutting blades and a linear cutting blade extending therebetween; said blades being of such depth and extend for severing a section of insulation from a conductor; said tool being adapted for high temperature heating prior to operation, for effecting a sealing of the exposed ends of the insulation after severing, to prevent unauthorized contact of the conductive component with moisture and the like.

3,599,515

## CAM MEANS FOR TORQUE WRENCHES

Bosko Grabovac, c/o C.D.I., 818 East Broadway, San Gabriel, Calif.

Filed Oct. 3, 1969, Ser. No. 863,558
Int. Cl. B25b
U.S. Cl. 81—52.5 6 Claims



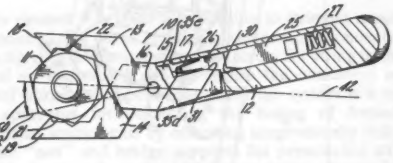
A self-centering cam means for use in torque wrenches comprising axially spaced, normally aligned, axially inwardly opening and opposing truncated conical recesses in spaced, normally opposing ends of a laterally shiftable spring-loaded plunger, and an elongate normally axially extending cam block between the arm and plunger, with flat opposite ends normally establishing flat seated engagement on the bottoms of the recesses, flat, laterally outwardly disposed longitudinal sides on planes normal to the pivotal axis of the arm and converging with the ends to define straight pivot edges extending along cord lines across the bottoms of the recesses and radially outwardly disposed longitudinally extending convex intermediate sides, the ends of which define arcuate edges, the radiuses of which are equal with the radiuses of bottoms of the recesses and which normally engage in the corners established by the bottoms and side of the recesses.

3,599,516

## WRENCH

Richard W. Smedley, c/o The Smedley Co., 1008 Alann Drive, Joliet, Ill.

Filed June 16, 1969, Ser. No. 833,275
Int. Cl. B25b *13/32*
U.S. Cl. 81—116 2 Claims



An open end wrench is provided for operating upon a nominal size of nuts and boltheads, which need not be removed from the nut or bolthead being operated upon to obtain a new bite. The wrench includes a fixed jaw and a wrench handle integral therewith, and a movable jaw and a locking lever integral therewith, the movable jaw and lever being pivotally mounted upon the fixed jaw and handle, biasing means which cooperates with the locking lever and handle in scissors fashion to selectively force the wrench jaws into a nut- or bolt-grasping position, and a slide lock for locking the jaws into such position. Alternative slide lock arrangements are provided.

3,599,517

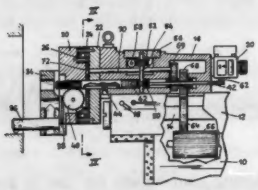
## BORING AND FACING HEAD FOR MACHINE TOOLS

Johann Muller, Unterhaching, Germany, assignor to Friedrich Deckel Praezisions Mechanik und Maschinenbau, Munich, Germany

Filed May 8, 1969, Ser. No. 822,953
Claims priority, application Austria, May 13, 1968, Feb. 7, 1969, A 4590/68;A 1290/69
Int. Cl. B23b *5/00*
U.S. Cl. 82—2 E 10 Claims

A boring and facing head for machine tools, in which the tool slide is radially displaceable on a rotating carrier. For radial adjustment of the tool slide, the slide is provided with a

rack engaged by a gear mounted on and rotating with the slide carrier, the gear being turned for adjustment purposes by a nonrotating adjusting member extending along the axis of rotation of the carrier and projecting out the back of the housing, the projecting end of the adjusting member being provided with a scale which can be read while the carrier is



rotating. The rotating carrier is driven by a shaft parallel to but offset radially from the axis of rotation. In one form of the invention, gauging stops are provided on a turret, for cooperation with a dial gauge or an end gauge, in order to determine accurately the position of the axially movable adjusting member which serves to adjust the radial position of the tool slide on the rotating slide carrier.

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**3,599,518**

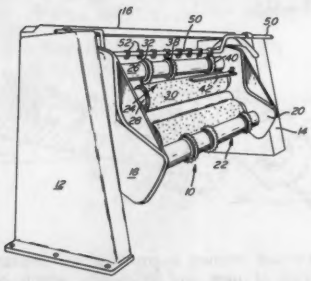
**PAPERBOARD CUTTING APPARATUS AND METHOD**

**Walter J. Goettsch, Kenilworth, Ill., assignor to Harris-Intertype Corporation, Cleveland, Ohio**

**Continuation-in-part of application Ser. No. 706,179, Feb. 16, 1968, now Patent No. 3,508,460. This application Nov. 17, 1969, Ser. No. 877,356**

**Int. Cl. B26d 1/22**

**U.S. Cl. 83—13** **9 Claims**



Corrugated paperboard is cut or slit by rotating circular blades having a serrated edge while the paperboard is supported by a full face rotating brush roll juxtaposed to said circular blades. Nozzle means are provided for discharging a mist on the circular blades to clean the same during operation. A support plate is provided adjacent the nip on the feed-in side to prevent the paperboard from drooping and thereby assure a good clean cut.

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**3,599,519**

**PROCESS OF HOLDING AND PERFORMING AN OPERATION ON THE OUTER COIL OF A TIMEPIECE HAIR SPRING**

**Ulrich Leupin, Bienne, Switzerland, assignor to Societe des Fabriques de Spriaux Reunis, Bienne, Switzerland**

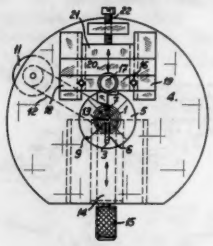
**Filed Feb. 20, 1969, Ser. No. 800,992**

**Claims priority, application Switzerland, Feb. 28, 1968, 2912/68**

**Int. Cl. B26d 7/14**

**U.S. Cl. 83—18** **3 Claims**

A process for facilitating operations to be made on the outer coil of a timepiece hair spring consists in positioning the hair spring on a support and holding it by its inner end, and pressing together against the center the coils located on the side opposite the center of the location on the outer coil where it is desired to effect this operation in order to increase the spacing between the coils on the other side. A



device for carrying out this process has a frame in which is mounted a rotating broach for maintaining the inner end of the hair spring and a horizontal slider moving in the direction of the broach and having a vertical finger intended to compress the coils of the hair spring.

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**3,599,520**

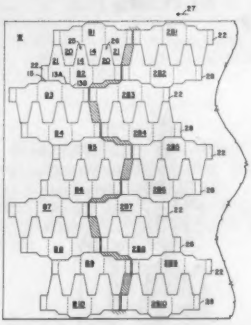
**METHOD OF DIECUTTING A BLANK**

**Prentice J. Wood, Jonesboro, Ga., assignor to The Mead Corporation**

**Filed Oct. 29, 1969, Ser. No. 872,289**

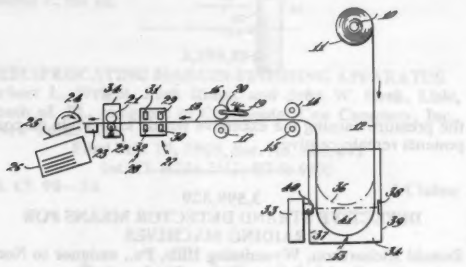
**Int. Cl. B31b 1/20**

**U.S. Cl. 83—32** **4 Claims**



A method of diecutting a blank having a plurality of projections extending along one side edge thereof and an outwardly extending protrusion along the opposite side edge thereof and disposed intermediate tapered end portions along the said opposite side edge, the method comprising arranging a die so that the blanks are cut from a web in aligned rows with the blanks of each row disposed in the same orientation and with the rows arranged in pairs of rows. Each blank in each row is arranged so that the outwardly extending projections along one side edge thereof occupy all of the cutaway areas between the outwardly extending projections of a nested blank in the other row of each pair of blanks. The blanks in corresponding rows of alternate pairs of rows are disposed in transverse alignment with each other so that a single course of articles in a direction transverse of the web from which blanks are cut may be cut and detached from the remaining portion of the web simultaneously.

3,599,521
AUTOMATIC FILM CUTTER
Richard G. Lee, Weston, Mass., assignor to Alves Photo Service, Inc., Braintree, Mass.
Filed June 25, 1969, Ser. No. 836,253
Int. Cl. B26d 5/32, 5/34
U.S. Cl. 83—210 7 Claims



An apparatus for automatically and accurately cutting frames from a film strip, which apparatus uses a control system which advances the film strip to a cutter, at a high speed, changes the film strip advancement to a lower speed after the strip reaches a first predetermined position relative to the cutter, and brakes the film strip when it reaches a second predetermined position, at which latter position the cut is made. This operation is performed cyclically as the film advances so that a plurality of accurately cut frames results. Means are further provided for supplying the film strip material without longitudinal tension to avoid damage thereto.

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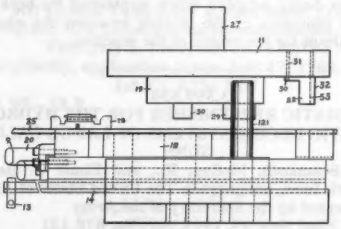
3,599,522
DIE SET
Peter A. Traphagen, and Karol T. Dyczynski, both of Erie, Pa., assignors to Hanley Development Corporation, Erie, Pa.
Filed Mar. 7, 1969, Ser. No. 805,210
Int. Cl. B26d 5/26
U.S. Cl. 83—399 5 Claims



The device disclosed provides a punch and die set in which accurate locating guides are provided to match the punch to the die perfectly to avoid damaging the cutting edges. The shearing operation on soft rubber requires an absolute match between punch and die without the clearance usually used in other forms of trimming dies. This has especial utility in shearing operations on soft rubber and the like.

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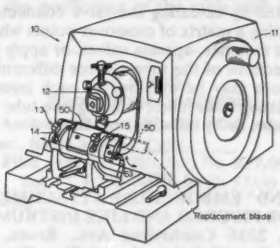
3,599,523
DISPOSABLE BLADE AND HOLDER FOR MICROTOME
John E. P. Pickett, 3323 Pinafore Drive, Durham, N.C.
Filed Dec. 15, 1969, Ser. No. 885,143
Int. Cl. G01n 1/06
U.S. Cl. 83—412 7 Claims

The conventional, thick, microtome knife that is resharpened after use is replaced by a thin, flexible, disposable and commercially available blade which has a microtome quality cutting edge and which is held by a blade holder that in turn is received by a conventional knife clamp. The blade holder is adapted to flex, clamp and tension the disposable blade




and includes an adjustable cam mechanism which allows the technician to replace blades without disturbing the holder.

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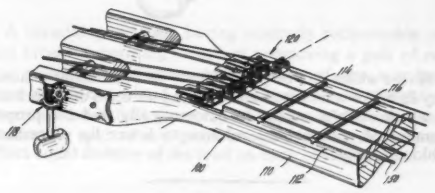
3,599,524
NUT-MOUNT FOR STRINGED INSTRUMENT FINGERBOARDS
Ralph S. Jones, Hyattstown, Md.
Continuation-in-part of application Ser. No. 722,620, Apr. 19, 1968. This application Dec. 22, 1969, Ser. No. 887,437
Int. Cl. G10d 3/14
U.S. Cl. 84—314 5 Claims



The present invention is applicable to stringed musical instrument having movable bridge, and comprises novel means for achieving intonation selectivity string for string in the tuning of an instrument and to ensure the consistent turning thereof during operation. Essentially the system is a method and apparatus for correcting the tuning of fretted and nonfretted instruments by offsetting longitudinally individual contact "nut" and bridge supports for preselected strings a variable distance from the 12th fret or center of scale length.

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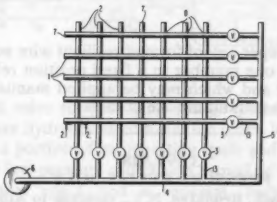
3,599,525
PNEUMATIC CROSSBAR DEVICE
Paul A. Klann, P.O. Box 2398, Waynesboro, Va.
Filed May 14, 1970, Ser. No. 37,242
Int. Cl. G10b 1/00; H01h 35/40; F16l 55/14
U.S. Cl. 84—331 6 Claims



A pneumatic crossbar device includes a plurality of flexible inflatable tubes positioned on two levels with the tubes in each level being spaced apart and parallel to one another and with the tubes of each level lying at right angles to and ad-

jacent the tubes of the other level. Each tube of the crossbar device is sealed at one end and the other end is connected to an individually operated valve for controlling the supply of air pressure to the tube. Each tube may be individually inflated or deflated by actuating the valve connected thereto, thereby presenting a matrix of crossover points which may be used to actuate switches, operate valves, or apply pressure at selected intersections of the tubes. Three different cross-sectional dimensions may be obtained at each intersection by selectively deflating both tubes, inflating one tube and deflating the other tube, or by inflating both tubes.

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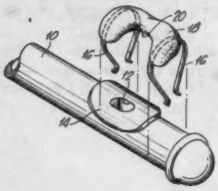
**3,599,526**
**"EASY FIND" EMBOUCHURE ATTACHMENT TO FLUTE OR PICCOLO AND LIKE INSTRUMENTS**
**Vito Sollecito, 2316 Cambreleng Ave., Bronx, N.Y., and Thomas Cavolina, 1548 Kennelworth Place, Bronx, N.Y.**
**Filed Jan. 16, 1970, Ser. No. 3,327**
**Int. Cl. G10d** *9/00*
**U.S. Cl. 84—384** **6 Claims**



A device which can be permanently or detachably secured to any flutelike wind instrument having an open embouchure hole which enables a user to automatically find the proper placement of embouchure relative to lower lip placement and blowing angle.

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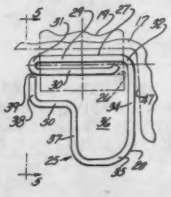
**3,599,527**
**KEEPER KEY**
**William H. Howells, Cleveland, Ohio, assignor to Midland-Ross Corporation, Cleveland, Ohio**
**Filed Apr. 14, 1969, Ser. No. 815,901**
**Int. Cl. F16b** *21/14*
**U.S. Cl. 85—8.3** **4 Claims**



A reusable keeper key of formed resilient wire adapted for use in retaining one member in a fixed position relative to a second member and which may be applied manually in one simple operation without the use of tools.

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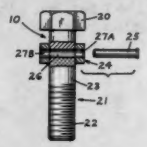
**3,599,528**
**PRESSURE RELIEF BOLT**
**Julian H. Kushnick, Brooklyn, N.Y., assignor to Allied Chemical Corporation, New York, N.Y.**
**Filed Aug. 21, 1969, Ser. No. 851,807**
**Int. Cl. F16b** *31/02*
**U.S. Cl. 85—62** **4 Claims**

A bolt with annular collar slidably mounted upon the shank and retained in place by means of a shearpin passing through the collar and shank. When the tensile load on the bolt exceeds the design limit of the pin, the pin will shear and the collar will slide up against the bolthead, thereby relieving



the pressure causing the excessive tensile load while all components remain captive.

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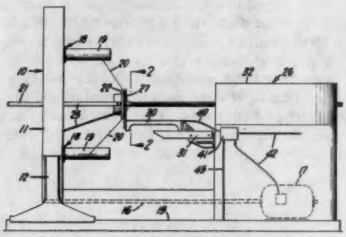
**3,599,529**
**DEFECTIVE STRAND DETECTOR MEANS FOR BRAIDING MACHINES**
**Donald Richardson, Wyomissing Hills, Pa., assignor to North American Rockwell Corporation, Pittsburgh, Pa.**
**Filed Apr. 9, 1970, Ser. No. 26,816**
**Int. Cl. D04c** *3/38*
**U.S. Cl. 87—19** **4 Claims**



Detector means for braiding machines adapted to braid multifilament wire strands in forming braided armored coverings for high-pressure hose and the like, the detector means including a ring member, positioned between the strand carriers of the machine and the braided covering, and ring member being adapted when contacted by both slack and broken filaments of the strands to open the electrical operating circuit for the motor of the machine.

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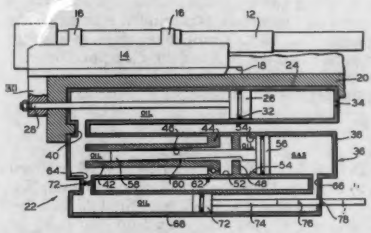
**3,599,530**
**AUTOMATIC REPLENISHER FOR THE HYDRO-PNEUMATIC RECOIL SYSTEMS OF LARGE CALIBER GUNS**
**Robert E. Seamands, Moline, Ill., and Elmer J. Henning, Bettendorf, Iowa, assignors to The United States of America as represented by the Secretary of the Army**
**Filed Nov. 19, 1969, Ser. No. 878,121**
**Int. Cl. F41f** *19/02*
**U.S. Cl. 89—43 R** **4 Claims**



In order to maintain a uniform starting point for the reciprocable piston in a hydropneumatic recuperator of the

type utilized in the recoil systems of large caliber guns, a reservoir is jointly connected to each of the gas and oil chambers in the recuperator and is provided with a floating piston arranged to separate the oil and the gas into individual areas and maintain an equilibrium position therebetween arranged to return the recuperator piston against a fixed stop at the end of each firing cycle regardless of any change in the volume of the oil.

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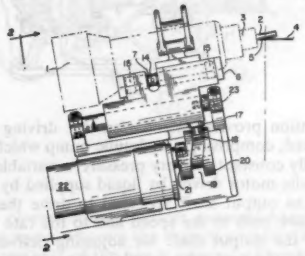
**3,599,531**

**RECIPROCATING MARGIN-FINISHING APPARATUS**

**Norbert L. Wright, Park Ridge, and John W. Grek, Lisle, both of, Ill., assignors to Continental Can Company, Inc., New York, N.Y.**

**Filed Feb. 19, 1969, Ser. No. 800,441**
**Int. Cl. B23c *3/12*; B24b *9/00***
**U.S. Cl. 90—14** **4 Claims**



A reciprocating margin-finishing apparatus for applying the side of a rotating burr tool along the margin of a piece of flexible flat stock. To avoid wear of the burr tool in a restricted area, the burr tool is reciprocated along its longitudinal axis by reciprocating the high-speed motor which turns it. The motor is mounted on a slide element and the slide element is reciprocated by a constant feed cam to distribute wear evenly across the cutting edge of the burr tool.

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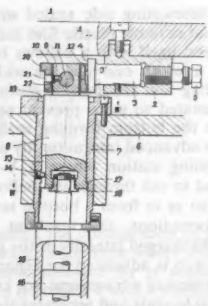
**3,599,532**

**APPARATUS FOR ACCURATELY POSITIONING THE MOVABLE TABLE OF A MACHINE TOOL**

**Kingo Matsui, 428, Takaoka-cho, Hamamatsu-shi, Japan**

**Filed July 2, 1969, Ser. No. 838,711**
**Claims priority, application Japan, July 17, 1968, 43/50136**
**Int. Cl. B23d *7/08***
**U.S. Cl. 90—58 R** **3 Claims**



An apparatus for accurately positioning the table of a machine tool comprising a member on the table having a contact surface and a member on the bed having a receiving surface, the member on the bed being movable into and out of position wherein it can engage the member on the table and being rotatable about a vertical axis, one of said members being free to rock about a horizontal axis perpendicular to the axis of motion of the table. The contact surface and receiving surface meet in surface-to-surface contact thus controlling the positioning of the table with respect to the bed.

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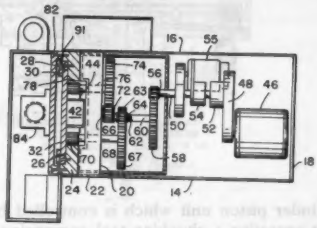
**3,599,533**

**BROACHING MACHINE**

**Russell W. Anthony, Harper Woods, Mich., assignor to Lear Siegler, Inc., Santa Monica, Calif.**

**Filed June 27, 1969, Ser. No. 837,098**
**Int. Cl. B23d *41/08*; F16h *57/00***
**U.S. Cl. 90—96** **10 Claims**




A broaching machine having relatively reciprocable work and broach-supporting members comprising a pair of racks and pinions for effecting reciprocation of one member, a drive motor connected to a spline shaft, a pair of rigidly interconnected helical gears on said spline shaft, and gearing connecting each of said gears to one of said pinions so as to effect equal division of the load on each of said pinions.

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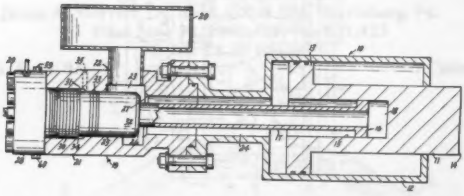
**3,599,534**

**PREFILL VALVE FOR HYDRAULIC CLAMPING DEVICES**

**Richard Purchon, Warwickshire, England, assignor to Cincinnati Milacron Inc., Cincinnati, Ohio**

**Filed Feb. 2, 1970, Ser. No. 7,600**
**Int. Cl. F15b *11/00***
**U.S. Cl. 91—411 A** **6 Claims**



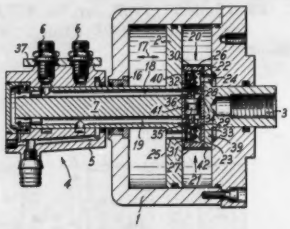
A prefill valve for providing a large quantity of relatively low-pressure hydraulic fluid to fill the space behind a moving piston for a portion of its operating cycle and thereafter sealing off the low-pressure source and providing communication between that space and a separate, high-pressure fluid source. The valve includes a slidable sleeve having a double-acting piston at one end and a face at its other end which cooperates with the valve body to effect closing of the low-pressure fluid source. The valve is actuated by one or more hydraulically actuated auxiliary pistons which move the slidable sleeve to the closed position and interconnect the high-pressure fluid source with the space behind the piston.

3,599,535

## ROTARY CHUCKING CYLINDER FOR MACHINE TOOL

Gunter Horst Rohm, Sontheim, Germany, assignor to Rohm-Gesellschaft m.b.H., Werkzeug-und Maschinenfabrik, Sontheim-Brenz, Germany

Filed Mar. 18, 1970, Ser. No. 20,671
Claims priority, application Germany, Apr. 11, 1969, P 19 18 423.7
Int. Cl. F15b *11/08, 13/042*
U.S. Cl. 91—420 2 Claims



A cylinder piston unit which is controlled by a pressure fluid for operating a chucking tool comprising a valve unit having two check valves and a small intermediate control piston within a transverse bore in a hub of the piston shaft, which hub has a diameter equal to the total length of the valve unit. The valve unit is held in place by a single locking ring.

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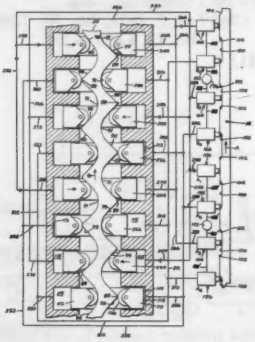
3,599,536

## TORQUE MOTOR

Lester L. Myers, Fort Wayne, Ind., assignor to Mobile Aerial Towers, Inc., Fort Wayne, Ind.

Filed Aug. 28, 1969, Ser. No. 853,778
Int. Cl. F01b *3/04, 13/04*
U.S. Cl. 91—480 14 Claims



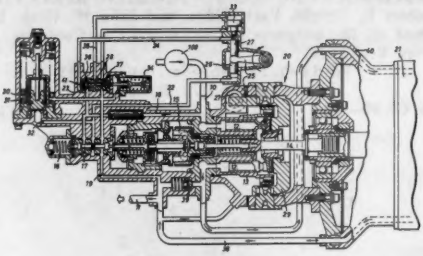
An output shaft has coaxially secured thereto a generally cylindrically shaped rotor. The rotor has undulating opposite end surfaces characterized by a plurality of lobes. A carrier slidably supports a plurality of individual double-acting pistons. These pistons each carry a pair of bearings for engaging the end surfaces, respectively, of the rotor. A flow control device is connected with a suitable source of fluid pressure and includes poppet valves which are operated by cam means carried on the outer periphery of the rotor for controlling the flow of fluid to the pistons in predetermined sequence to cause rotation of the rotor and the output shaft.

3,599,537

## CONSTANT SPEED DRIVE

Charles Phillip Smith, Wolverhampton; Stanley George Glaze, Brierley Hill, and John Roger Wynne, Wolverhampton, all of, England, assignors to H. M. Hobson Limited, London, England

Filed Nov. 12, 1969, Ser. No. 875,936
Claims priority, application Great Britain, Nov. 12, 1968, 53598/68
Int. Cl. F04b *1/02, 49/00*
U.S. Cl. 91—506 2 Claims



The invention provides mechanism for driving a load at constant speed, comprising a hydraulic pump which develops a substantially constant delivery pressure, a variable displacement hydraulic motor driven by liquid supplied by the pump and having an output shaft arranged to drive the load and means sensitive both to the speed and to the rate of change of speed of the output shaft for adjusting delivery control mechanism of the motor to maintain the output shaft at a constant speed.

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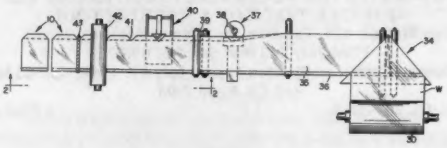
3,599,538

## THREE DIMENSIONAL BAG FORMING METHOD AND APPARATUS

Thomas E. Piazze, Mount Vernon, Ohio, assignor to Continental Can Company, Inc., New York, N.Y.

Filed May 7, 1969, Ser. No. 822,527
Int. Cl. B31b *1/22, 49/04, 45/00*
U.S. Cl. 93—33 H 9 Claims



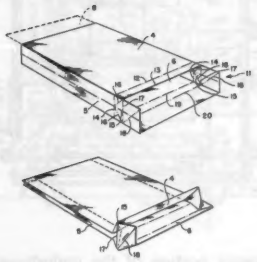
A method of fabricating side sealed square bottom bags from a web of heat sealable plastic film material wherein the web is folded upon itself with a bellows fold formed at the edge which has a width one-half the width of the bottom desired for the bag and the outside surfaces which overlie each other are treated so as to prevent sealing in the areas thereof in which the bottom forming seals are to be made, the folded web is advanced intermittently across a platen at a bottom seal forming station where a V-shaped hot knife device is operated to cut through the bellows fold margin at spaced intervals so as to form a bottom seal on each of two adjoining bag formations, the resultant triangular-shaped waste portion is discharged laterally of the path of advance of the web and the web is advanced for separation into successive bags by operation of a transverse hot knife sealing device which forms the side seals and separates the bags on a transverse line extending from the apex of the triangular waste portion. The bottom seal-forming device is in the form of an attachment comprising a platen, a V-shaped hot sealing knife mounted for cooperation with the platen and a means for disposing of the triangular waste chip resulting from the operation of the hot knife which comprises a driven roller and cooperating clamping rollers operating to close on the chip and remove the same in a direction laterally of the sealing station.

3,599,539

## METHOD OF MAKING A SEWN CLOSURE SQUARE BOTTOM BAG

Stephen L. Coverstone, and Raymond K. Hughes, both of Richmond, Va., assignors to Hoerner Waldorf Corporation, Ramsey, Minn.

Division of Ser. No. 702,065, Jan. 31, 1968, Pat. No. 3,473,724.
Filed Apr. 15, 1969, Ser. No. 816,283
Int. Cl. B31b *1/26, 1/90, 45/00*
U.S. Cl. 93—35 SB 15 Claims



A sewn closure square bottom gusseted bag, and process for making same, wherein the bottom construction thereof is such that one side of the bag is integral with a bottom panel, which panel is sealingly attached by sewing along one edge to the edge of the inner face of the other side of the bag. A flap may be attached to said other side which is either folded over the bottom panel or tucked between the bottom panel and said other side of the bag.

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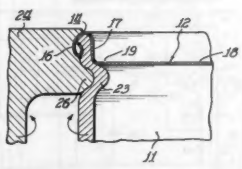
3,599,540

## METHOD OF MAKING COMBINATION OF CONTAINER BODY AND CLOSURE THEREFOR

Melvin A. Koboldt, St. Louis, and Lester W. Uhles, Pacific, both of, Mo., assignors to Container Corporation of America, Chicago, Ill.

Filed Apr. 9, 1969, Ser. No. 814,700
Int. Cl. B31b *17/74*
U.S. Cl. 93—39.1 1 Claim



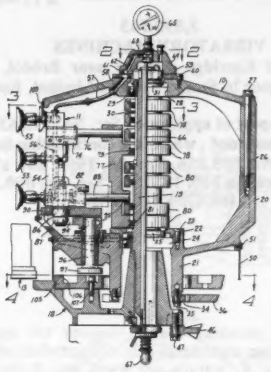
A method of making the combination of a container body and a closure therefor of the type where the closure and the can body are interconnected by a seaming flange, and wherein the closure is provided with a weakened score line of smaller transverse dimension than the transverse dimension of the resultant seaming flange so that the weakened score line is spaced a small distance from said seaming flange, comprising the simultaneous forming of such seaming flange and a rib in said container body having an inside transverse dimension which is slightly less than the transverse dimension of said weakened score line whereby upon removal of that part of the closure between said weakened score line, said rib will protect against injury occasioned by the remaining portion of said closure adjacent to said seaming flange.

3,599,541

## CONTAINER BLANK VARIABLE-SPEED FEEDER APPARATUS

Robert J. Allen, Farmington, Mich., assignor to Ex-Cell-O Corporation, Detroit, Mich.

Filed May 22, 1969, Ser. No. 826,928
Int. Cl. B31b *1/76*
U.S. Cl. 93—53 R 8 Claims



A container blank feeder apparatus for feeding containers in a collapsed form from a container magazine to a feeding station on a machine for erecting the containers for forming and filling operations, and which includes a base, a rotatable turret mounted on said base for rotation about a vertical axis, power means for rotating the turret at a constant angular speed in one direction, a plurality of suction cup means movably mounted for rotation about said vertical axis and for radial outward and inward movements relative to said turret for gripping and removing collapsed containers from the magazine and conveying them to said feeding station, and means operative in response to rotation of the turret about said vertical axis for rotating said suction cup means simultaneously with said turret between said container magazine and said feeding station, and for stopping each of said suction cup means at said magazine and moving them radially outward to grip a collapsed container in said magazine and thence radially inward to withdraw the container from said magazine and transfer it at constant speed to said feeding station.

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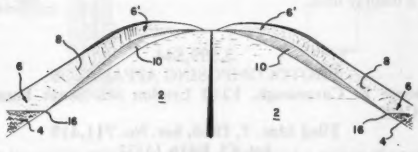
3,599,542

## WARPED PLANE BERM

James A. Morrett, Jr., R. D. 4, Box 986, Harrisburg, Pa.

Filed June 30, 1969, Ser. No. 837,423
Int. Cl. E01c *1/00*
U.S. Cl. 94—1 3 Claims



This invention relates to a structural configuration, the purpose of which is to eliminate the possibility of having a mismanaged vehicle collide with the ends of parapet walls, piers or other conventional bridge components. Said structural configuration is a long, warped plane which begins as a concrete extension and continuation of a highway or road berm or shoulder and gradually evolves into a more or less vertical position, forming the parapet for a bridge. Said warped plane will cause a mismanaged vehicle to be

gradually led back on the highway, away from the parapet or other obstruction. My invention precludes the possibility of a head-on collision with parapet walls and the like by eliminating their end profiles or areas. This is done by blending the more or less vertical obstruction into the more or less horizontal plane of the berm or shoulder via the warped plane.

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**3,599,543**

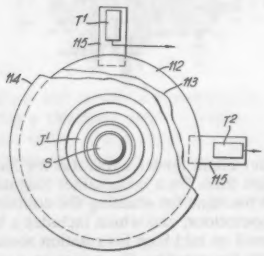
## VIBRATORY MACHINES

**Norman Edward Kerridge, Salford near Bristol, Somerset, England, assignor to Stothert & Pitt Limited, Bath, Somerset, England**

**Continuation-in-part of application Ser. No. 718,638, Apr. 3, 1968, now abandoned , which is a continuation-in-part of application Ser. No. 509,856, Nov. 26, 1965, now abandoned. This application Feb. 18, 1969, Ser. No. 800,213**

**Int. Cl. E01c *19/28***

**U.S. Cl. 94—50** **11 Claims**




In a vibratory machine having a member which is vibrationally excited by a force of substantially constant amplitude and frequency, and which is placed against the surface of material to be compacted, the degree of compaction achieved is measured by producing a signal proportional to the magnitude of the maximum instantaneous amplitude of the vibratory movement of the vibratory member due to its excitation and the effects of the material, the signal being passed to a display unit and/or used to control an operating parameter of the machine. The machine may be a vibratory roller, the roll of which is the vibrated member. Preferably one or more acceleration transducers are mounted on the vibratory member, and their outputs are integrated twice against time to provide a signal proportional to the instantaneous amplitude of vibration on the operative axis of the transducer or transducers. Two transducers may be placed at right angles and their signals combined, or an appropriate number of transducers may be placed on different axes so that one at least will always have an integrated output closely approximating to the maximum instantaneous amplitude, the correct signal, if more than one transducer is used, being chosen by selecting the largest integrated output for passage to a display unit.

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**3,599,544**

## PHOTOCOMPOSING APPARATUS

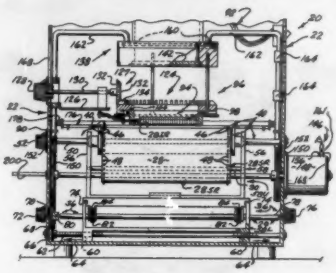
**George F. Cavanaugh, 1210 Lyndon St., South Pasadena, Calif.**

**Filed Mar. 7, 1968, Ser. No. 711,410**

**Int. Cl. B41b *15/02***

**U.S. Cl. 95—4.5** **7 Claims**

The specification disclosed photocomposing apparatus for producing printing plates without the use of conventional type, but by a photocomposing method wherein optical mats or matrices capable of use in direct photographic contact printing of a photosensitive film panel, may be handset in a composing stick in a manner using all of the conventional skills of a printer who has normally been trained in handsetting conventional type in a composing stick. Thus, the only difference that such a printer will find in using the apparatus of the present invention is that he will handset the optical mats or matrices instead of conventional type, and after he has composed a line of copy he will insert the composing stick in the machine, and it will be moved downwardly into contact-printing relationship with respect to a line exposure portion of an underlying photosensitive film panel and will then be subjected to light which will pass through transparent portions of the line of optical mats or matrices and will not pass through opaque portions thereof, thus exposing



the line exposure portion of the underlying photosensitive film panel in a manner which, when developed, will bear the desired sequence of alpha-numeric symbols, such as letters or numbers, comprising the various words of the desired line of copy. This operation is repeated for each line of copy, and means is provided for correspondingly moving the underlying film panel in a positively externally indicating manner for copy positioning and correlation purposes.

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**3,599,545**

## PHOTOGRAPHIC CAMERS WITH ELECTRONIC EXPOSURE CONTROL

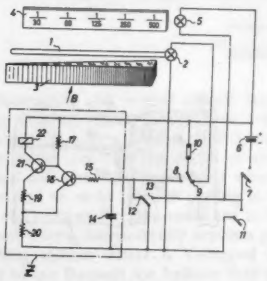
**Helmut Durr; George Klepek, and Rainer Vesper, all of Munich, Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany**

**Filed Feb. 3, 1970, Ser. No. 8,187**

**Claims priority, application Germany, Feb. 6, 1969, P 19 05 842.5**

**Int. Cl. G01j *1/08, 1/44;* G03b *7/02***

**U.S. Cl. 95—10 C** **15 Claims**



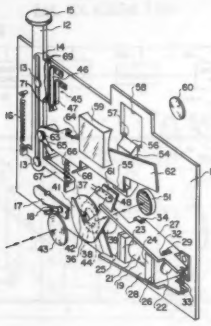
A photographic camera with electronic exposure control and an exposure time indicator. A time scale is arranged along the length of an elongated light source which provides light at uniform intensity and as a function of the brightness condition prevailing at the object to be photographed. The light intensity of the source is varied through a photosensitive element in the electronic exposure control unit. A light attenuating member in the form of a wedge-shaped element in front of the light source extends along the length of the timing scale and provides attenuation which varies continuously in a progressive manner from one end of the wedge-shaped element to the other. A glass member with interference layers and illuminated from an auxiliary light source, is arranged to provide more precise indicating results.

3,599,546

## EXPOSURE CONTROL WITH LOW LIGHT SIGNAL

Donald M. Harvey, Webster, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 27, 1969, Ser. No. 853,434
Int. Cl. G03b 7/08, 17/20
U.S. Cl. 95—10 C 12 Claims



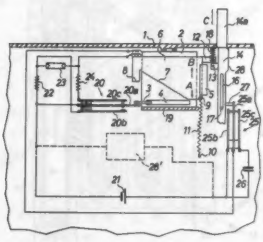
The disclosure relates to cameras of the type provided with an automatic exposure control system including an armature which assumes one of two positions according to whether an electromagnet is energized above or below a predetermined energization level as a function of the intensity of scene illumination detected by a photocell. During the initial movement of a shutter operating member, the armature first serves to provide a warning signal if scene illumination is below a predetermined energization level. In response to further movement of the shutter operating member, the warning signal is terminated, whereupon the same armature then serves to adjust an exposure controlling element of the camera.

3,599,547

## PHOTOGRAPHIC APPARATUS WITH AUTOMATIC EXPOSURE CONTROL MEANS

Karl Wagner, Ottobrunn, Germany, assignor to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed May 27, 1969, Ser. No. 828,147
Claims priority, application Germany, June 1, 1968, P 17 72 558.5
Int. Cl. G03b 7/14
U.S. Cl. 95—10 C 11 Claims



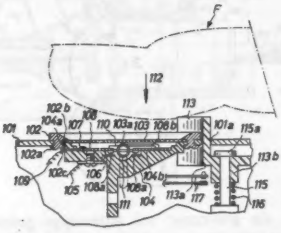
A photographic apparatus wherein the needle of the light meter is movable between first and second ranges of positions which respectively indicate higher and lower scene brightnesses. A detector which is movable into engagement with the needles in response to actuation of the camera release selects the size of the diaphragm aperture as a function of a higher scene brightness and selects a constant medium aperture size when the brightness of the scene is low. The exposure time is selected as a function of scene brightness; however, the rate at which the exposure time changes when the needle moves within the first range of positions is different from the rate at which the exposure time changes when the needle moves within the second range of positions, i.e., when the aperture size remains constant.

3,599,548

## RELEASE MEANS FOR PHOTOGRAPHIC APPARATUS

Fridolin Hennig, Munich, Germany, assignor to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed Apr. 13, 1970, Ser. No. 27,531
Claims priority, application Germany, Apr. 15, 1969, P 19 19 014.8
Int. Cl. G03b 17/00
U.S. Cl. 95—11 R 10 Claims



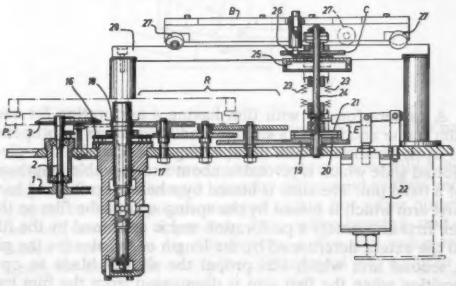
A release for motion picture cameras or still cameras wherein the deformation of a diaphragm results in closing of a switch which can open the shutter. A knob is mounted close to the diaphragm and is displaceable by the finger which exerts a deforming stress on the diaphragm to thereby close a second switch which can complete the circuit of the exposure control and/or a battery tester. The knob surrounds at least a portion of the diaphragm to facilitate simultaneous application of finger pressure against the knob and against the central part of the diaphragm.

3,599,549

## IMAGE AND SOUND TRACKS SUPPORTS, RECORDING APPARATUS AND APPARATUS FOR READING SAID TRACKS

Emile Jean Diuzet, Meudon, France, assignor to Societe Industrielle Des Nouvelles Techniques Radioelectriques Et De Electronique Francaise (Sintra), Asnieres (Hauts de Seine), France

Filed Apr. 11, 1968, Ser. No. 720,657
Claims priority, application France, Apr. 13, 1967, 102,658
Int. Cl. G03b 31/06
U.S. Cl. 95—12 16 Claims



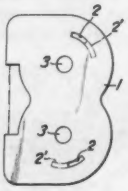
The invention relates to a film presenting a series of sound tracks and a series of images. Each sound track is a spiral lodged between two concentric circles and each image is placed inside the smallest circle of a sound track. The invention also refers to an apparatus for the optical recording of such sound tracks and images. It comprises a light modulator, means for effecting the two movements capable of generating a spiral, and recording means. The invention also concerns an apparatus for the optical reading of such sound tracks in spiral. It comprises an optical outfit of which at least one of the elements is subjected to a movement resulting from a movement of rotation and a rectilinear movement.

**3,599,550**

## FILM MAGAZINE FOR MOVIE CAMERAS

**Keezi Kaneko, Minamiashigara-Machi, Japan, assignor to Fuji Shashin Film Kabushiki Kaisha, Minamiashigaramachi, Ashigarakami-gun, Japan**

Division of Ser. No. 427,733, Jan. 25, 1965, Pat. No. 3,434,782
Filed June 12, 1968, Ser. No. 736,407
Int. Cl. G03b *17/26, 19/04*
U.S. Cl. 95—31 FS 4 Claims



Film magazine for use in movie cameras wherein the sensitivity of the film within the magazine is mechanically represented by arcuate grooves upon the side thereof; the length of said grooves being proportional to the sensitivity of the film.

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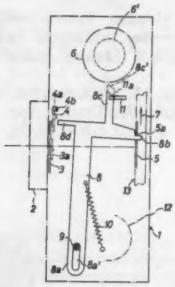
**3,599,551**

## FILM-METERING AND SHUTTER-COCKING DEVICE

**Gerhard Lemme, Munich, Germany, assignor to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany**

Filed Apr. 18, 1969, Ser. No. 818,188
Claims priority, application Germany, Apr. 19, 1968, P 17 72 245.1
Int. Cl. G03b *1/62, 9/68*
U.S. Cl. 95—31 FM 10 Claims



A camera for use with film having a perforation for each film frame and having a shutter blade which can be propelled to open position, a film-transporting wheel, and a one-piece slotted slide which is pivotable about and movable lengthwise of a fixed pin. The slide is biased by a helical spring and has a first arm which is biased by the spring against the film so that the first arm enters a perforation and is entrained by the film to the extent determined by the length of the slot for the pin, a second arm which can propel the shutter blade to open position when the first arm is disengaged from the film by a release, and a third arm which is located in the path of the release when the first arm extends into the perforation and the film is transported by the full length of a frame.

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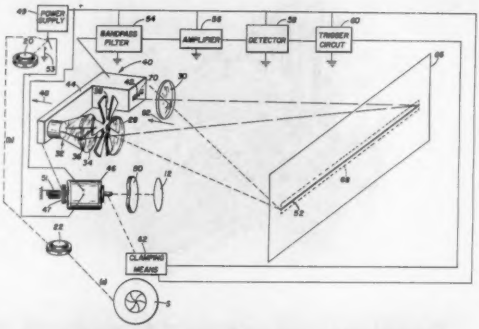
**3,599,552**

## AUTOMATIC FOCUSING DEVICE

**Donald M. Harvey, Webster, N.Y., assignor to Eastman Kodak Company, Rochester**

Filed Aug. 26, 1969, Ser. No. 853,093
Int. Cl. G03b *3/00*
U.S. Cl. 95—44 C 8 Claims

A camera having an electrical power supply, a light emitting shutter, an objective lens, and apparatus for automatic focusing having first and second lenses. Modulated radiant energy of predetermined frequency is transmitted through the first lens toward the subject. The reflected image from the subject is passed by the second lens and received by a light sensitive transducer. The energy emitting source and the light sensitive transducer are displaced in unison to vary the modulated radiant energy reflected from the subject.




Electronic detection circuitry is coupled to the light sensitive transducer to develop an output signal when the modulated radiant energy incident on the light sensitive transducer is at a maximum. The output signal is applied to arrest further displacement of the energy emitting source and the light sensitive transducer. The objective lens is moved toward a position that is determined by the displacement of the energy emitting source and the light sensitive transducer.

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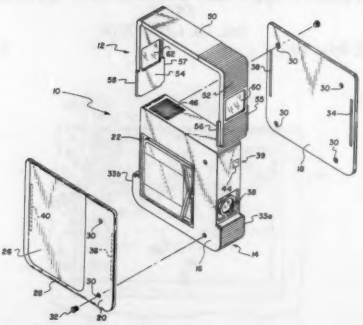
**3,599,553**

## SLIDABLE COVER AND HANDLE MEMBER FOR PHOTOGRAPHIC CAMERAS

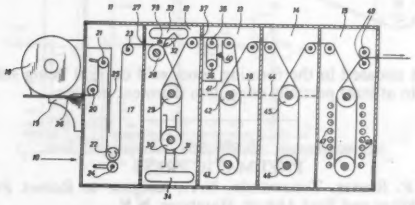
**David E. Hansen, Fairport, and Arthur H. Crapsey, Rochester, both of, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.**

Filed June 26, 1969, Ser. No. 836,752
Int. Cl. G03b *17/56*
U.S. Cl. 95—86 3 Claims



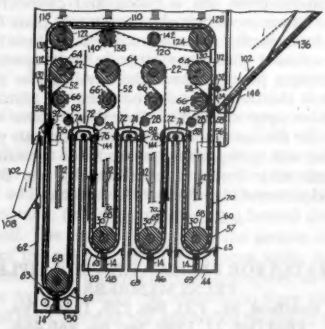
A combined cover and handle member for a still or motion picture camera has a substantially rigid U-shaped configuration and is mounted on the camera casing for movement between an extended position and a retracted position. In the extended position the handle member serves as an aid for supporting the camera while taking pictures, and for carrying the camera between picture-taking operations. In the retracted position the handle member does not substantially increase the exterior dimensions of the camera and can be used as a cover for enclosing various camera mechanisms, such as the objective, light-sensitive cell, viewfinder, and trigger-operating member. Moreover, such camera mechanisms can be covered in the closed position of the handle member even though the mechanisms are located on more than a single side of the camera.

3,599,554
METHOD AND APPARATUS FOR VISCOUS PROCESSING
Marcel Frans Aelterman, and Louis Achilles Meeussen, both of Mortsel, Belgium, assignors to Gevaert-AGFA N.V., Mortsel, Belgium
Filed July 3, 1968, Ser. No. 742,065
Claims priority, application Great Britain, July 3, 1967, 30,626/67
Int. Cl. G03d 5/00
U.S. Cl. 95—89 R 16 Claims



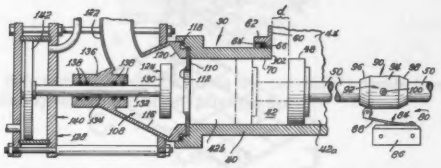
Method and apparatus for processing an exposed photographic film in which the film has a thin coating of a processing composition applied thereto after which it is maintained in a processing zone having a controlled atmosphere for a predetermined period of time and then has the composition removed therefrom. The atmosphere of the processing zone is maintained at a substantially constant wet bulb temperature and at a relative humidity which is not greater than the relative humidity at which the coating of processing composition is in equilibrium therewith.

3,599,555
AUTOMATIC CONVEYOR FOR X-RAY FILM PROCESSING
Emery Dutch, 320 W. 77 th St., New York, N.Y.
Filed Mar. 5, 1970, Ser. No. 16,820
Int. Cl. G03d 3/12
U.S. Cl. 95—94 R 8 Claims



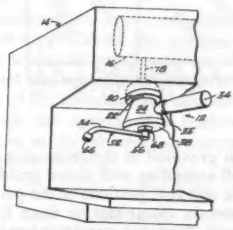
An apparatus for treating sheet film such as an X-ray film in which the film is automatically transported into and between a number of processing receptacles and then through a drying chamber. The film is retained on a film engaging and carrying device in a manner ensuring its secure retention as it travels between the processing receptacles. The film is transported through each receptacle by a separate conveyor here shown as a dentated belt, and is automatically removed from one belt and conveyed onto another belt in the succeeding receptacle. As the film approaches the end of the drying chamber it is automatically stripped.

3,599,556
VACUUMIZING APPARATUS
Ditlev P. Madsen, Palos Park, Ill., assignor to Chemetron Corporation, Chicago, Ill.
Filed Jan. 29, 1970, Ser. No. 6,802
Int. Cl. B65b 31/00
U.S. Cl. 99—272 10 Claims



In vacuumizing apparatus for removing air from meat emulsions and like food products, an improved pump is provided to substantially reduce problems of surging and smearing of food products. The improved pump comprises actuating means for actuating control means to cause the piston of the pump to assume a predetermined adjusted rest position and improved checking return flow of food products to the pump chambers.

3,599,557
COFFEE-BREWING ASSEMBLY FOR ESPRESSO COFFEEMAKING DEVICE
Virgilio Leal, 323 Almeria St., Urb. Valencia-Rio Piedras, P.R.
Filed May 19, 1970, Ser. No. 38,787
Int. Cl. A47j 31/06
U.S. Cl. 99—302 R 8 Claims

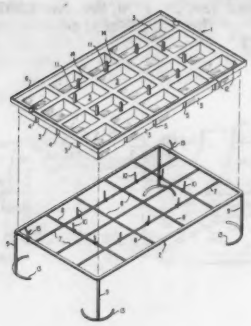


A hand-manipulative coffee-brewing unit for detachable use with a South American-type espresso coffeemaking apparatus. The coffee-brewing unit includes a bowllike body adapted for containing a quantity of ground coffee and is adapted to be twist lock engaged with a hot water outlet of the coffeemaking apparatus. The coffee-brewing unit includes filter means for filtering the coffee and swing spout means for use in dispensing the coffee liquid into a cup or the like.

3,599,558
COOKING ACCESSORY
Allan R. Goldberg, Whiffletree Farm, North Stanwhich Road, Greenwich, Conn.
Filed June 3, 1969, Ser. No. 829,951
Int. Cl. A47j 43/00
U.S. Cl. 99—339 11 Claims

Disclosed herein is a cooking accessory including a rack having an open network of supporting ribs and at least three legs for spacing said ribs from the bottom of an oven, and a disposable broiler pan having a plurality of compartments

defining a network of channels adapted to mate with the network of supporting ribs of said rack. Said broiler pan is constructed of lightweight inexpensive material to be thrown away after a single use and the supporting rack gives strength to the lightweight pan.



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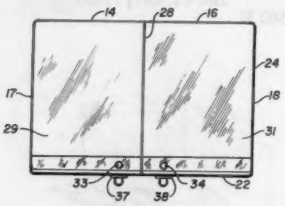
**3,599,559**

**COMBINATION WET-DRY GRIDDLE**

**Roy Eugene Presley, 4434 Shady Lane, Indianapolis, Ind., and Hubert Eugene Halcomb, P.O. Box 1595, Indianapolis, Ind.**

Filed Jan. 2, 1970, Ser. No. 141
Int. Cl. A47j *37/12*
U.S. Cl. 99—339 7 Claims



A settling trough provided at the front of a griddle plate has an exterior wall extending well above griddle plate level and around the side and rear portions of the perimeter of the griddle plate to contain oil or fat for deep frying of food products. An integral divider is provided from the front to the back and a drain is provided at the bottom of each settling trough with a separate valve in each drain permitting withdrawal of oil from one side of the divider independent of the other side, for simultaneous dry griddling at the one side and wet frying at the other. Independently controlled heating means are provided for each side of the divider.

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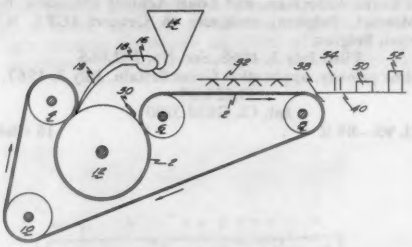
**3,599,560**

**SLICED MEAT MANUFACTURE**

**Ogden A. Clemens, Chicago, Ill., assignor to Swift & Company, Chicago, Ill.**

Filed Jan. 12, 1970, Ser. No. 2,301
Int. Cl. H05b *7/06*
U.S. Cl. 99—355 3 Claims

An apparatus for producing continuous ribbons of cooked meat emulsions suitable for individual slices comprising: a forming roller having at least one continuous forming zone on the outer surfaces; a feeding means for supplying a meat emulsion to each said forming zone; an endless conductive belt passing around a portion of the periphery of said roller and operable to move in unison therewith, whereby at least one enclosed forming zone is produced between the belt and roller in which the meat emulsion is encased; and an electric circuit means for passing an electric current from the roller through the meat emulsion to the belt when the meat emulsion is encased in the forming zone, said current being sufficient to at least partially coagulate the meat protein.



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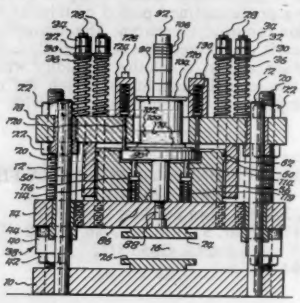
**3,599,561**

**PNEUMATIC PRESS**

**John F. Reeves, Tonawanda, N.Y., assignor to Robert Paul Lickliter and Earl Abbott, Hamburg, N.Y.**

Filed Nov. 17, 1969, Ser. No. 877,067
Int. Cl. B30b *1/38, 15/16*
U.S. Cl. 100—53 13 Claims



A pneumatic press has a piston and cylinder mounted between an upper mounting plate and a ram plate for driving the latter downwardly. An exhaust valve controls flow of air from the cylinder through a large exhaust opening in the upper mounting plate to atmosphere. Air under pressure is trapped in a chamber provided between the piston and the exhaust valve upon closing of the exhaust valve to preload the piston for the succeeding operation. Such air pressure in conjunction with spring-biased means holds the exhaust valve closed until their force is exceeded by the force of a mechanical actuator movable with the piston.

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**3,599,562**

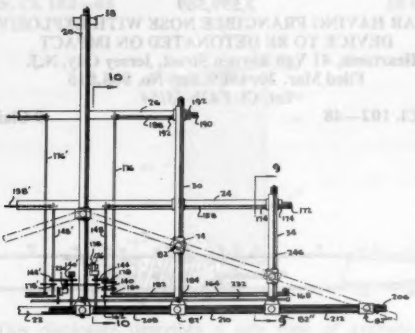
**APPARATUS FOR FABRICATING MULTIPLE TYPE TRUSS MEMBERS**

**Ralph W. Hutchens, Sr., P.O. Box 128, Toano, Va.**

Filed Oct. 22, 1969, Ser. No. 868,464
Int. Cl. B30b *15/00*
U.S. Cl. 100—100 25 Claims

A plurality of power-actuated press devices are adjustably supported for movement to desired positions in which the timber components of a truss are positioned with the juncture of one or more timber elements being supported by the press devices which upon actuation impress nail plates into the various timber members for joining the timber members to each other; all of the timber members are positioned in the final form of the truss with all of the press assemblies being simultaneously actuated to provide the finished truss. Changeover from one form of truss assembly to another is enabled by electric motor drive means connected to the press assem-

blies by drive transmission chains for automatically positioning the press devices in accordance with the nature of the truss to be assembled. Another aspect of the invention



resides in the particular nail-plate press devices in which a single power source provides the movement necessary for opening the press and for impressing the nail-plates in the timber members.

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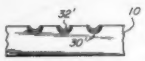
**3,599,563**

**METHOD OF MARKING MATERIALS SUBJECT TO ELONGATION EMPLOYING HEATED DIES**

**Richard Stephen Schwartz, Union Township, Union, N.J., assignor to Thomas & Betts Corporation, Elizabeth, N.J.**

**Filed May 19, 1969, Ser. No. 825,912**
**Int. Cl. B44c *1/24*; B41c *1/02***
**U.S. Cl. 101—32** **7 Claims**



The disclosure is directed to the method of marking materials subject to elongation as by stretching. The method comprises the steps of placing in a surface of the material at least one groove in a direction generally transverse to the direction of elongation of the material and applying to the groove coloring material in such a manner that the coloring material adheres to the sidewalls of the groove, thus permitting the coloring material to elongate with the material without breaking, flaking or separating from the sidewalls of such groove. A first method permits the forming of the groove and adding the coloring material thereto by the use of a colored metallic foil inserted between a heated die and the material itself. The heated die forming the groove causes the adherence of the colored foil to the groove walls. According to other methods the grooves may be preformed as by use of cold dies or by premolding the material to have the groove within it and then coloring the groove by means of stamping through a colored foil or painting.

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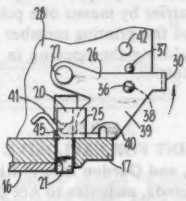
**3,599,564**

**PRINT CONTROL DEVICE**

**Helmut K. Waibel, San Lorenzo, Calif., assignor to The Singer Company, New York, N.Y.**

**Filed Aug. 4, 1969, Ser. No. 847,282**
**Int. Cl. B41j *1/60***
**U.S. Cl. 101—109** **4 Claims**

A printing slug which forms a part of the postal indicium plate of a postage meter and is movable between a print and nonprint position by means of a manually controlled lever. The relationship of the printing surface of the slug to that of



the indicium is not critical since the manually settable lever resiliently retains the slug in print position.

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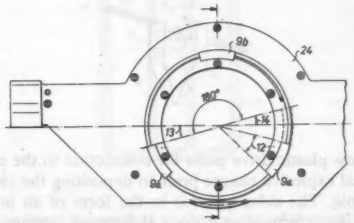
**3,599,565**

**ROTARY SCREEN PRINTING MACHINE WITH IMPROVED MOUNTING FOR THE SCREEN**

**Kurt Feier, Riedholz; Hans Werthmuller, Wiler, and Max Breitenmoser, Wiler near Utzenstorf, all of, Switzerland, assignors to Firma Fritz Buser AG, Wiler near Utzenstorf, Switzerland**

**Filed Sept. 23, 1968, Ser. No. 761,526**
**Claims priority, application Switzerland, Sept. 26, 1967, 13406/67**
**Int. Cl. B41f *15/38*; B41l *13/06***
**U.S. Cl. 101—116** **8 Claims**



There is disclosed an improved rotary screen printing machine of the type wherein the printing stations are each equipped with a circular printing screen which, as required, can be removed and again remounted. According to an important aspect of the invention, the circular printing screen is secured through the agency of a resiliently biased intermediate member to the mounting or support disk means arranged at the machine frame.

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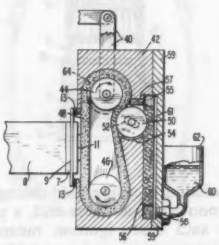
**3,599,566**

**SEALED PRINTING MECHANISM USING HIGHLY VOLATILE INKS**

**Leslie A. Fish, 180 Bowers Ave., Phillipsburg, N.J.**

**Filed June 10, 1968, Ser. No. 735,800**
**Int. Cl. B41k *1/42***
**U.S. Cl. 101—333** **6 Claims**



A printing attachment in which a sealed housing containing an ink carrier is supplied with all types of inks including

highly volatile inks. An opening in the housing exposes a portion of the ink carrier for purposes of periodically transferring ink from the carrier by means of a printing member to a printing surface, and the printing member is provided with a sealing means for closing the opening in the housing when contacting the ink carrier.

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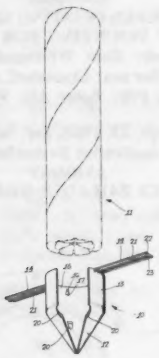
**3,599,567**
**DRIVE POINT FOR EXPLOSIVE CHARGE**

**Stanley T. Graham, and Gordon Robert Rintoul, both of Calgary, Alberta, Canada, assignors to Ace Explosives Ltd., Alberta, Canada**

**Filed Dec. 26, 1968, Ser. No. 786,907**
**Int. Cl. E21b *43/26*; F42b *3/00*; F42c *3/00***
**U.S. Cl. 102—21.8** **3 Claims**



A hollow plastic drive point for connection to the end of a cylindrical explosive charge prior to depositing the charge in a drill hole. The drive point is in the form of an integrally moulded body providing a conical forward portion and an open-ended rear portion defining a cylindrical inner surface for engaging the charge as the drive point is slid over the end of the charge so as to frictionally hold the drive point on the charge.

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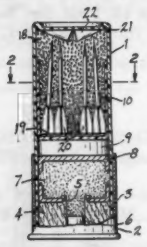
**3,599,568**
**LONG-RANGE SHOTSHELL**

**Richard J. Shellnutt, Northford, and Earl R. Jenkins, Clinton, both of, Conn., assignors to Olin Mathieson Chemical Corporation**

**Filed Mar. 31, 1965, Ser. No. 444,142**
**Int. Cl. F42b *7/02, 13/16***
**U.S. Cl. 102—42 C** **12 Claims**



A cartridge including a casing, said casing having a base at one end and a mouth at the other end, a propellant in said casing adjacent said base, ignition means to ignite said propellant, wad means positioned over said propellant, a projectile-surrounding member adjacent said wad means, a plurality of elongated projectiles arranged in said member and extending substantially longitudinally of said casing, filler means dispersed in and occupying the spaces between said projectiles to maintain the projectiles in a predetermined arrangement and control the dispersion of the projectiles, and a closure closing said mouth.

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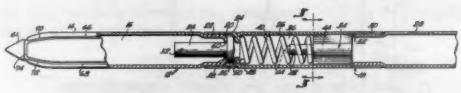
**3,599,569**
**SPEAR HAVING FRANGIBLE NOSE WITH EXPLOSIVE DEVICE TO BE DETONATED ON IMPACT**

**Olaf Heartness, 41 Van Reypen Street, Jersey City, N.J.**

**Filed Mar. 20, 1969, Ser. No. 808,815**
**Int. Cl. F42b *13/54***
**U.S. Cl. 102—48** **9 Claims**



A disposable, explosive spear head with a frangible nose section weakened in a predetermined manner and including a gas expansion chamber to burst the nose portion with an explodable cartridge arranged in the chamber and in a fixed position relative to the main spear casing and in the path of travel of a firing pin captivated in the spear and adapted to be driven into the firing pin against a spring-biasing means to ignite the cartridge and burst the nose portion.

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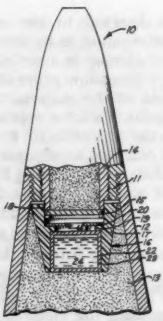
**3,599,570**
**AMMUNITION ANTIDEFUZING DEVICE**

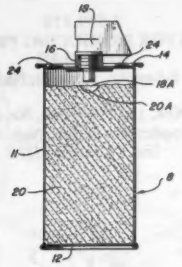
**William C. Ingersoll, Huntsville, Ala., and Jack W. Shepherd, Hyland, N.Y., assignors to Thiokol Chemical Corporation, Bristol, Pa.**

**Filed Aug. 28, 1969, Ser. No. 853,705**
**Int. Cl. F42b *13/02***
**U.S. Cl. 102—57** **10 Claims**



A device consisting of a container, which is filled with a liquid chemical material having combustion characteristics, that is positioned in a bomb or shell in conjunction with the fuze therefor, so that upon impact of the bomb or shell with the target, the container will be ruptured and cause the liquid chemical material to be dispersed in the explosive in the bomb or shell and in the event the bomb or shell is a dud, that any attempts to remove the fuze therefrom, will result in the liquid chemical material being exposed to the atmosphere, water or the perspiration of any one removing the fuze, to cause the liquid chemical material to combust and thus ignite or detonate the explosives within the bomb or shell.

3,599,571
WALKING GRENADE
Jack Y. Richardson, Mouth-of-Wilson, Va., assignor to Brunswick Corporation, Chicago, Ill.
Filed Apr. 18, 1969, Ser. No. 817,539
Int. Cl. F42b 27/00
U.S. Cl. 102—65 18 Claims



This disclosure describes a new type of grenade. The grenade comprises a housing with an aerosal generating mixture therein. Fuse means is provided to ignite the fuel-oxider portion of the aerosol generating mixture causing it to burn and thereby causing another portion of the aerosol generating mixture to vaporize. The pressure developed in the grenade opens ports that dispense the vapor in a preselected direction and concomitant therewith causes the grenade to move. The vapor can be any desired vaporizable material such as an insecticide, antipersonnel reagent, etc.

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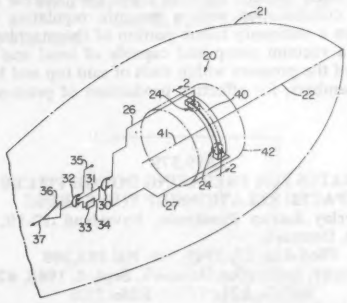
3,599,572
SAFING AND ARMING SYSTEM FOR A MUNITION
Donald A. Brackman, Englewood, Ohio, assignor to AVCO Corporation, Richmond, Ind.
Filed Oct. 22, 1969, Ser. No. 868,412
Int. Cl. F42c 13/00; F42b 21/38
U.S. Cl. 102—70.2 16 Claims



A control apparatus comprising a safing and arming system for a munition wherein such apparatus requires only two sensors mounted about a reference axis in angularly spaced relation. The sensors are operatively connected to provide an effective arming signal for the munition only by the simultaneous provision of a signal from both sensors under conditions of sustained free fall and the sensors are incapable of providing signals simultaneously during normal handling of the munition, making it safe to handle.

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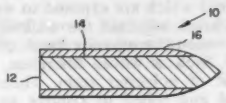
3,599,573
COMPOSITE PREFORMED PENETRATORS
Joseph L. Sliney, West Concord, Mass., assignor to Whittaker Corporation, Nuclear Metals Division, West Concord, Mass.
Filed May 31, 1968, Ser. No. 733,596
Int. Cl. F42b 11/00
U.S. Cl. 102—92.4 9 Claims

An improved armor-piercing projectile has a hard but brittle inner core metallurgically bonded to a tough but ductile outer shell which protects the core from brittle fracture on impact. The bimetallic structure of the projectile provides a



higher penetration ability against "hard-faced" armor plate for a given size projectile than heretofore obtainable with homogeneous projectiles.

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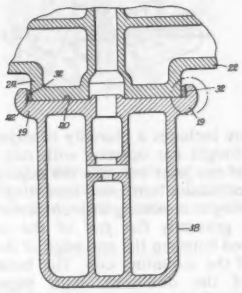
3,599,574
CENTER PLATE WEAR LINER RING
Hugh G. Robertson, Alliance, Ohio, assignor to Amsted Industries Incorporated, Chicago, Ill.
Filed Apr. 1, 1969, Ser. No. 811,984
Int. Cl. B61f 5/14, 5/11; F16c 17/04
U.S. Cl. 105—199 C 1 Claim



A wear ring is provided in the recess of the truck bolster center plate to protect the vertical annular wall of said recess. The annular wall is inclined outward from top to bottom, and the outer surface of the ring is similarly tapered outward to restrain the ring from vertical movements. The ring has a gap to enable expansion of the ring against the interior wall. The ring is welded to the wall at the gap.

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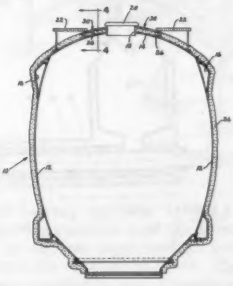
3,599,575
WEAR RESISTANT SURFACE FOR POLYURETHANE FOAM MATERIAL ON SURFACE OF RAILWAY CAR
Frank R. Yurkoski, Bridgeton, and Philip J. De Frank, Hazelwood, both of, Mo., assignors to ACF Industries, Incorporated, New York, N.Y.
Filed June 9, 1969, Ser. No. 831,418
Int. Cl. B61d 5/00, 5/04
U.S. Cl. 105—358 1 Claim



An insulated covered hopper railway car having a layer of rigid polyurethane foam applied on the outer surface thereof

by spraying in place. An outer coat of a polyester resin is applied, such as by manual brushing, onto the outer surface of the polyurethane foam material on certain areas of the polyurethane foam material which are exposed to wear and abrasion, such as roof areas adjacent the walkway or running board and areas between the separate hatch covers. A layer of fibrous material, such as woven fiberglass, is then positioned on the coat of polyester resin. Then, the fibrous material is brushed and rolled to remove any air and to embed the material in the coat of polyester resin. The resin is then allowed to gel and cure which will be around 45 minutes at 77° F.

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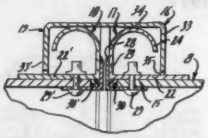
**3,599,576**

## COVER CONSTRUCTION FOR RAILROAD CARS

**Harold E. Vickerman, Milwaukee, Wis., assignor to The General Tire & Rubber Company, Akron, Ohio**

**Filed Feb. 17, 1969, Ser. No. 799,811**
**Int. Cl. B61j *39/00***
**U.S. Cl. 105—377** **11 Claims**



This disclosure includes a plurality of adjacent top covers for a railroad freight car opening with rain deflectors and batten sealing of the joint between the adjacent covers. The rain deflector includes a horizontal mounting flange and bottom plate defining a mounting clip conforming to and projecting over a generally flat end of the cover. Caulking material is placed between the end edge of the cover and the base portion of the mounting clip. The batten rests on the upper edge of the deflectors with depending vertical sidewalls closely spaced to the mounting flange.

Ribbed sealing elements are secured to the deflector sidewalls and extend outwardly into engagement with an adjacent deflector to horizontally seal the space between the deflectors. The batten resting on the rain deflectors in combination with the sealing members establish an effective seal against light and liquid leakage.

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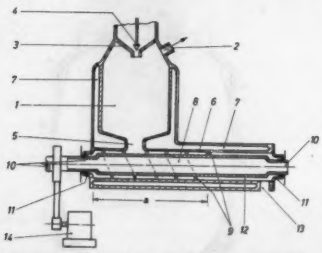
**3,599,577**

## APPARATUS FOR WITHDRAWAL OF VISCOUS OR PULPY HARD SUGAR MASSES FROM OPEN SPACES UNDER VACUUM, IN PARTICULAR IN COOKING MACHINES

**Gunter Niebisch, Bemerode, Germany, assignor to Otto Hansel GmbH, Hannover, Germany**

**Filed Aug. 26, 1969, Ser. No. 853,130**
**Int. Cl. A21c *11/20*; B29f *3/08***
**U.S. Cl. 107—4** **7 Claims**



An apparatus for withdrawal of viscous or pulpy hard sugar masses from spaces under vacuum, in particular in cooking machines, which comprises a feeding chamber, and a vacuum chamber connected with the feeding chamber. At least one threaded conveyor screw is operable in the feeding chamber and steplessly controllable as to its speed. The threads of the conveyor screw extend only along a part of the length of the feeding chamber, and the latter has an outlet and a storage chamber for masses to be conveyed cooperating with the feeding chamber.

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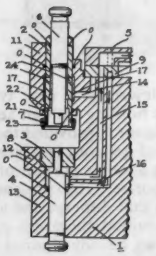
**3,599,578**

## APPARATUS FOR PRODUCING PRESS-MOLDED ARTICLES

**Fumio Sato, 7-24, 6-bancho, Koshien, Nishinomiya-shi, Hyoyo Pref., Japan**

**Filed Nov. 18, 1969, Ser. No. 877,769**
**Claims priority, application Japan, Nov. 18, 1968, 43/84292**
**Int. Cl. B30b *11/10***
**U.S. Cl. 107—17** **10 Claims**



A combination provided in each compressing unit of a conventional rotary punch-and-die tablet forming machine, including an upper punch, a guide sleeve bearing the upper punch, an upper surface of a matrix having a die cavity and capable of forming a top airtight chamber encircling the upper punch when the sleeve reaches its lowest position, and a bottom airtight chamber formed by a recess formed in a rotational structure which is covered with the matrix and encircling a lower punch. Each of these components is employed in collaboration with a pressure regulating means mounted on a stationary frame portion of the machine coupled with a vacuum pump and capable of local and timed reduction of the pressure within each of said top and bottom airtight chambers, for effective production of press-molded articles.

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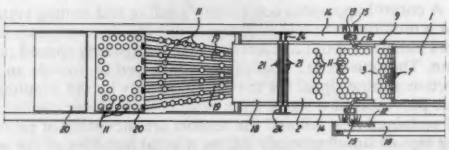
**3,599,579**

## APPARATUS FOR PREPARING DOUGH PIECES IN SPACED RELATIONSHIP FOR BAKING

**Julius Barclay Estrup Paaskesen, Naverland 17-19, 2600 Glostrup, Denmark**

**Filed Aug. 27, 1969, Ser. No. 853,389**
**Claims priority, application Denmark, Sept. 4, 1968, 4247/68**
**Int. Cl. A21c *11/10*; B26d *7/06***
**U.S. Cl. 107—69** **2 Claims**

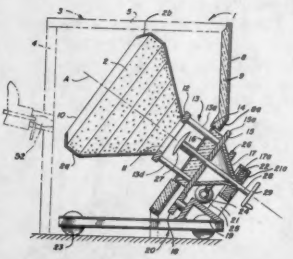


Dough pieces for baking buns or the like are punched out in polygonal, in particular hexagonal shape from a dough band advanced on a conveyor below a punching tool. The dough pieces are transferred to baking pans which are advanced below the dough band conveyor, by means of a plurality of narrow conveyors which are arranged in a fanlike configuration and driven at a higher speed than the dough band conveyor whereby the dough pieces are spaced from each other on the baking pan in the longitudinal and lateral directions thereof.

3,599,580
TABLE ASSEMBLY
Lowell E. Adair, St. Louis, and Walter Gusdorf, Creve Coeur, both of, Mo., assignors to Gusdorf & Sons, Inc., St. Louis, Mo.
Filed June 1, 1970, Ser. No. 41,817
Int. Cl. A47b 3/06
U.S. Cl. 108—153 6 Claims

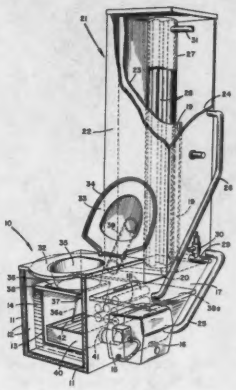
An assembly for tables or carts in which longitudinal stretcher members which interconnect the vertical legs are formed to receive the margins of a shelf, the transverse stretchers are grooved to receive the end edges of the shelf, the stretchers are interconnected in a manner to prevent rotation or loss of support for the shelf, and key elements lock the legs and stretchers together to provide a substantially rigid assembly.

3,599,581
INCINERATOR
Fritz Schoppe, Max-Ruettgers-Strasse 24, 8026 Ebenhausen, Germany
Filed May 20, 1969, Ser. No. 826,130
Int. Cl. F23g 5/06
U.S. Cl. 110—8 R 5 Claims



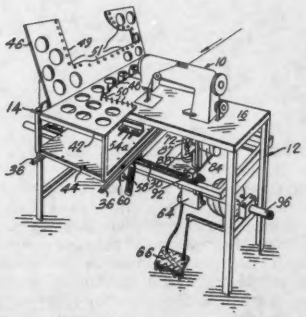
An improved maintenance system in a pyrometric cone incinerator having a conical basketlike hollow body located in a housing and having perforated walls. The basketlike hollow body is positioned rotatably about an axis inclined at an angle to the horizontal line and has an obliquely upwardly directed large feed opening and an obliquely downwardly directed smaller discharge opening. The discharge opening is aligned with a bar cage attached to the lower end of the conical body and coaxial therewith. The outer end of the bar cage is rotatably supported on a suitable bearing which supports the body and the bar cage on a portable frame. An access door is provided in the lower axial discharge opening of the conical body. An operating means including an operating shaft extends axially outwardly from the access door through the bar cage, drive means and bearing means to an external operating handle.

3,599,582
CENTRAL HEATING SYSTEM
Goran Emil Lagstrom, Essingeringen 72C, Stockholm, Sweden
Filed Apr. 8, 1969, Ser. No. 814,321
Claims priority, application Sweden, Apr. 19, 1968, 5302/68
Int. Cl. A47k 11/02
U.S. Cl. 110—9 4 Claims



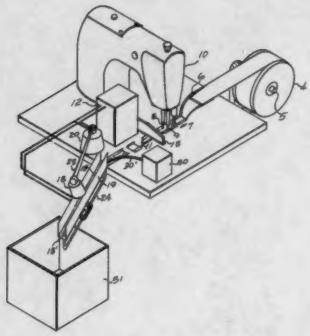
A central heating system in which the combustion chamber of the system also constitutes the combustion chamber of a nonflush-type toilet, in which waste matter is destroyed by combustion.

3,599,583
AUTOMATIC SEWING MACHINE
Icchok Majer Berman, 3117 Brighton Avenue; Lorenzo Brunozzi, 4243 Delorimier Street, and Rejean DeGuire, 6285 Louis Hebert Street, all of Montreal, Quebec, Canada
Continuation-in-part of application Ser. No. 646,994, June 19, 1967, now abandoned. This application Mar. 17, 1969, Ser. No. 814,229
Int. Cl. D05b 21/00
U.S. Cl. 112—121.12 11 Claims



An automatic sewing machine having a laterally moving carriage. The sewing machine is of the pressure foot type and as it operates an apparel supported on the laterally moving carriage, it forces the carriage to move. The sewing machine and carriage are adapted to sew continuous stitches on the apparel and driving means are provided cooperating with the sewing machine to move the carriage longitudinally to the next row to be stitched in accordance with a pattern being followed.

**3,599,584**
**AUTOMATICALLY CONTROLLED SEWING AND CUTTING APPARATUS**
**R. Earl Fowler, Binghamton, N.Y., assignor to Fred A. Smith & Co., Inc., Binghamton, N.Y.**
**Filed Dec. 18, 1968, Ser. No. 784,621**
**Int. Cl. D05b** *37/04*
**U.S. Cl. 112—130** **4 Claims**



This disclosure describes an automatically controlled sewing, cutting and handling apparatus, which automatically produces individual and completed workpieces, such as belts, shoulder straps, etc., from a continuous medium or fabric web and includes means for longitudinal hemming, transverse cutting and removing of a fabric.

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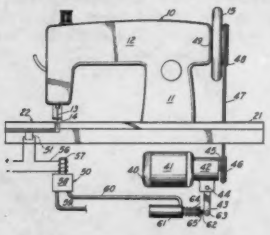
**3,599,585**
**AUTOMATIC CONTROLS FOR SEWING MACHINES**
**Glen H. Myrick, P.O. Box 233, Villa Rica, Ga.**
**Filed Dec. 22, 1969, Ser. No. 886,976**
**Int. Cl. D05b** *69/00*
**U.S. Cl. 112—217.3** **14 Claims**



An automatic control means for use in a sewing machine having at least one needle operating to form a line of stitching in response to a workpiece being placed in the position for a stitching operation. More particular, this invention includes a workpiece support plate pivotally mounted on said sewing machine for movement between a upward retracted position and a depressed position. A sensing means is operatively associated with said workpiece support plate for sensing movement of the workpiece support plate to the depressed position. A power drive motor is operatively associated with the sewing machine for effecting operation of the stitching needle. The power drive motor includes a clutch means for moving the power drive means between a nondriving condition and a driving condition. A pneumatic power control cylinder is operatively associated with the clutch means for effecting operation of the clutch means. The pneumatic power control cylinder includes an air supply line operatively connected therewith. An electromagnetic valve means is positioned within said air supply line. The electromagnetic valve means is operatively connected to the workpiece sensing switch whereby operation of the sensing switch will effect energization of the electromagnetic valve means to allow air under pressure to energize the pneumatic control cylinder which will in turn effect operation of the power drive means.

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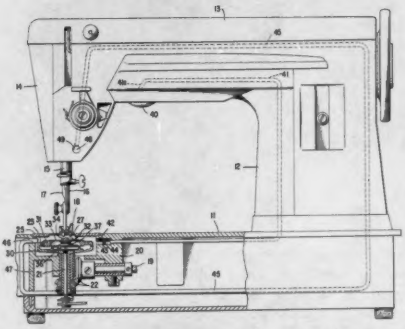
**3,599,586**
**BOBBIN THREAD DEPLETION DETECTOR FOR SEWING MACHINES**
**Albert L. Newman, Cleveland Heights, Ohio, assignor to The Singer Company, New York, N.Y.**
**Filed June 10, 1970, Ser. No. 45,148**
**Int. Cl. B65d** *63/00*
**U.S. Cl. 112—218 R** **11 Claims**



A beam from a light source is transmitted through a fiber optic bundle and is directed into the root region of a lockstitch sewing machine bobbin by a converging lens. A receiving fiber optic bundle receives the beam which passes through the root region of the bobbin when the thread on the bobbin is below a predetermined amount and directs the ray to a display screen in view of an operator to alert the operator that the thread remaining on the bobbin is near depletion.

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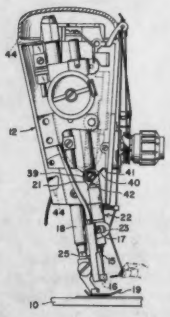
**3,599,587**
**SEWING MACHINE PNEUMATIC NEEDLE THREADER**
**Robert G. Greulich, Cranford, N.J., assignor to The Singer Company, New York, N.Y.**
**Filed Nov. 18, 1969, Ser. No. 877,709**
**Int. Cl. D05b** *87/00*
**U.S. Cl. 112—225** **5 Claims**



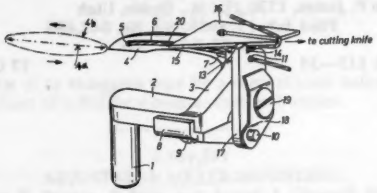
This disclosure relates to a pneumatic needle threader adapted for use in a sewing machine. The needle threader includes structure which permits a needle thread suction conduit to be manually swung from an inoperative storage position within the head of the sewing machine into a cooperative spring-biased engagement with the sewing needle-eye extremity and is utilized to thread the sewing needle.

3,599,588

## THREAD-CARRYING LOOPTAKER FOR CHAIN STITCH SEWING MACHINES WITH THREAD CATCHER AND CLAMPING DEVICE

Eugen Angele, Kaiserslautern/Upper Palatinate, Germany, assignor to GM Pfaff AG, Konigstrasse, Germany

Filed Apr. 6, 1970, Ser. No. 25,680
Claims priority, application Germany, Apr. 26, 1969, G 69 16 929
Int. Cl. D05b *65/00*
U.S. Cl. 112—252 7 Claims




A combined thread-carrying looptaker and cutting device for chain stitch sewing machines including a thread catcher is fitted with means to clamp, during initiation of a sewing operation, the free cut length of the thread comprising a spring-loaded clamping plate rotatively mounted upon the looptaker body about a pivot axis spaced from and parallel to the axis of a guide bore in the looptaker through which is passed the looptaker thread. The clamping plate has a further guide bore normally registering with the guide bore in the looptaker body and is deflected from its normal position by an abutment thereof camming with the edge of a thread catcher during the latter's displacement from its rest position to the thread-cutting position, resulting in clamping of the thread between the plate and looptaker body. The pull on the thread upon formation of the initial stitches of a subsequent sewing operation causes the automatic return of the clamping plate to its normal operating position.

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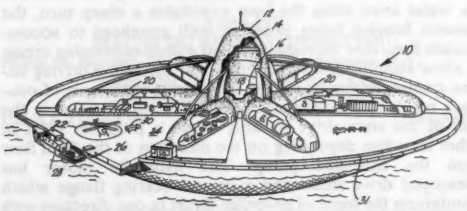
3,599,589

## EARTHQUAKE-RESISTANT NUCLEAR REACTOR STATION

Harold M. Busey, Kennewick, Wash., assignor to McDonnell Douglas Corporation

Filed Dec. 29, 1967, Ser. No. 694,479
Int. Cl. B63b *35/44*
U.S. Cl. 114—0.5 2 Claims



A floating structure for the protection of nuclear reactors from damage during earthquake shock wherein the structure is designed to absorb shocks without rupture of critical nuclear reactor equipment.

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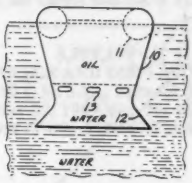
3,599,590

## FLOATING OIL-RECOVERY SUMP

Jose Dominguez Rego, 600 Broad St., Newark, N.J.

Filed June 10, 1969, Ser. No. 831,959
Int. Cl. B63b *35/00*
U.S. Cl. 114—0.5 3 Claims

A floating vessel comprising a hull having an upper end lying above the surface of a body of water and an open lower end lying below the water surface to admit and accumulate upward flowing oil or gas from an underwater well.

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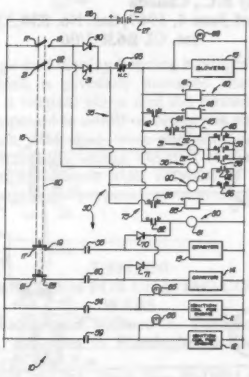
3,599,591

## SAFETY LOCKOUT IGNITION SYSTEM

Andrew C. Edelson, 10832 Charnock Road, Los Angeles, Calif.

Filed Oct. 9, 1969, Ser. No. 865,118
Int. Cl. B63j *2/06*
U.S. Cl. 114—211 7 Claims



An ignition switch for a powerboat having an ignition terminal connected to blowers for exhausting the engine compartment of fumes and to time-delay relays in series, in turn connected to a latching relay between a battery and an engine, and between the start terminal of the ignition switch and a starter, to prevent the engine from being started until the blowers have operated a preselected time duration to clear the engine compartment of dangerous fumes which might have collected therein. A control latching relay energized by the starter energizes a shutoff time-delay relay after a second predetermined time duration from starting, to open the normally closed contacts of a shutoff latching relay halting the operation of the blowers after the blowers have cleared the engine compartment of any fumes that might have accumulated therein during the starting of the engine.

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3,599,592

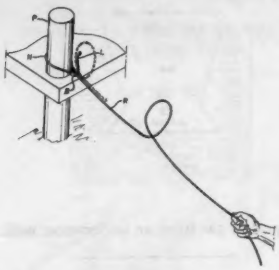
## RELEASABLE MOORING ROPE

Charles L. Welton, c/o Welton's Western Wear, Saratoga, Wyo.

Filed Oct. 27, 1969, Ser. No. 869,789
Int. Cl. B63b *21/00, 23/58;* F16g *11/00*
U.S. Cl. 114—230 9 Claims

A releasable mooring rope having one end formed as a noose by a throat block at the noose wherethrough the bight of the noose slidably extends and wherein the end of the rope at the noose is fitted, in a socket. The end of the rope carries a ferrule having a circumferential groove adapted to be engaged by a locking cam within the throat block in normal use, but to be released by rotation of the cam to permit the end of the rope to separate from the throat block and break

the noose. A lever connected to the cam outstands from the throat block and is adapted to be engaged by the rope, by



throwing a loop in the rope which will fall about the lever. Once engaged, a pull of the rope will rotate the lever to shift the cam to its releasing position.

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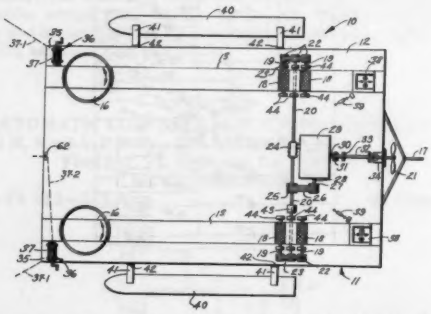
**3,599,593**
**AUTOMOBILE FERRY**
**Edward Nelles George Fleming, 3931 Bradshaw Diversion, R. R. #2, Langely B.C., Canada**
**Filed June 4, 1969, Ser. No. 830,330**
**Int. Cl. B63f *3/00***
**U.S. Cl. 115—0.5** **4 Claims**



A combination ferry and trailer device for an automobile, to be towed behind the automobile on land and serving as an automobile ferry on water. When the device is waterborne with the automobile loaded, it is propelled by the automobile engine, rollers engaging rear wheels of the car transmit engine power to a propeller. The device also has a pair of outrigger pontoons for stabilization.

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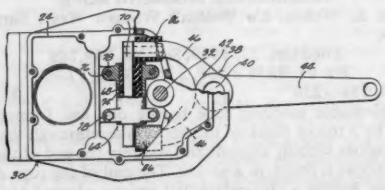
**3,599,594**
**SOUND AND VIBRATION ISOLATING MOUNT FOR AN OUTBOARD MOTOR**
**Dale L. Taipale, Waukegan, Ill., assignor to Outboard Marine Corporation, Waukegan, Ill.**
**Filed Sept. 11, 1969, Ser. No. 856,990**
**Int. Cl. B63h *21/26***
**U.S. Cl. 115—17** **15 Claims**



Disclosed herein is a sound and vibration isolating arrangement for an outboard motor having a marine propulsion unit mounted rearwardly of the steering axis of the outboard motor. The mounting arrangement includes a pair of mounts secured to the propulsion unit in a vertically spaced relation approximately in alignment with the neutral or roll axis of the propulsion unit and rearwardly of or behind the drive shaft. Each mount includes a crossbar which is supported by a resilient bushing within a casing and which has ends extending outwardly from the casing transversely to the direction of motion of the propulsion unit.

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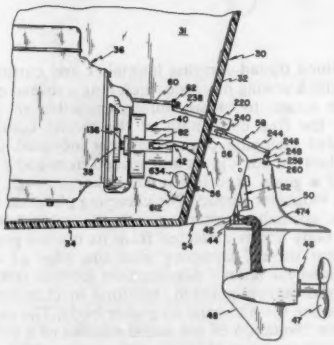
**3,599,595**
**OUTDRIVE FOR BOATS**
**William P. James, 1730 21st St., Ogden, Utah**
**Filed July 17, 1969, Ser. No. 842,486**
**Int. Cl. B63h *5/06***
**U.S. Cl. 115—34** **17 Claims**



An outdrive for a boat having a hydraulic pump including an eccentric ring which is rotatable to change the path of fluid flow under pressure so that the direction of drive of the motor can be easily reversed. Hydraulic fluid may be subjected to pressure with structure prior to communication thereof to the hydraulic pump. A transom bracket and stern drive housing support are connected so as to provide pivotal movement of the stern drive housing along two mutually perpendicular axes so that the stern drive housing will remain in the water even when the boat negotiates a sharp turn, the transom bracket being provided with couplings to accommodate fluid flow therethrough and a fluid-restraining recess to allow recirculation of cooling water through a driving engine carried by the boat. The stern drive housing is of one-piece molded construction. Hydraulic motor structure in the foot of the stern drive housing drives a propeller shaft in either direction depending on the direction of the fluid flow from the hydraulic pump. The hydraulic motor has telescoped drive shafts and a central bearing flange which counteracts the force of propeller thrust in one direction with hydraulic fluid pressure in the opposite direction.

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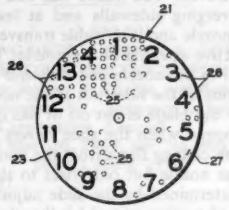
**3,599,596**
**METALLIC TAPE FOR VERTICAL SCALE INSTRUMENTS**
**Casimer F. Remus, Tunkhannock, and John Alan Moore, South Montrose, both of, Pa., assignors to The Bendix Corporation**
**Filed Oct. 7, 1969, Ser. No. 864,476**
**Int. Cl. G01d *21/00***
**U.S. Cl. 116—114** **9 Claims**

An indicating member for an instrument comprising a thin perforated metallic element and a translucent film laminated to the metallic element and arranged to overlay the perforations so that light from a source behind the metallic element

transilluminates the translucent film through the perforations in the metallic element. The indicating member may be in



the form of an elongated tape for a vertical scale indicator or in the form of a dial for a pointer-type instrument.

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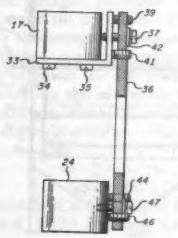
**3,599,597**
**ADJUSTABLE METER MOUNTING**
**William F. Maday, Tempe, and Joseph L. Tyrrell, Phoenix, both of, Ariz., assignors to Sperry Rand Corporation, Great Neck, N.Y.**
**Filed May 16, 1969, Ser. No. 825,199**
**Int. Cl. G09f** *9/00*
**U.S. Cl. 116—129** **6 Claims**



Apparatus for aligning a meter pointer relative to a housing in which the meter is installed. Three set screws arranged in a triangular pattern and threaded through a support structure rigidly affixed to the housing are adjustable to orient the meter relative to the support structure so that the pointer can move along a prescribed path free from contact with other components incorporated in the housing.

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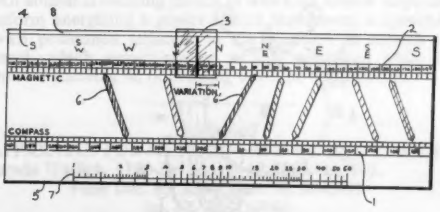
**3,599,598**
**MAGNETIC BEARING INDICATOR**
**Philip M. Banner, 28 Oxford Road, Massapequa, N.Y.**
**Filed Mar. 12, 1970, Ser. No. 18,821**
**Int. Cl. G08c** *5/00;* **G01c** *17/38*
**U.S. Cl. 116—130** **3 Claims**




A navigational computer for obtaining true bearing from magnetic compass information. The device has a compass bearing scale and a magnetic bearing scale. Magnetic deviation pointers for a representative number of bearings for the particular craft are previously attached to correlate the two scales. In use the compass reading is easily translated to magnetic bearing. A movable cursor is then moved from the magnetic reading to set in magnetic variation for the locality. The final reading under the cursor hairline is True Bearing.

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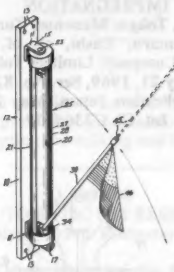
**3,599,599**
**FLAG STORAGE AND DISPLAY HOUSING**
**Terry R. Jones, 1050 C St. S.W., Ephrata, Wash.**
**Filed May 22, 1969, Ser. No. 826,826**
**Int. Cl. G09f** *17/00;* **A47b** *67/02;* **B61l** *21/00*
**U.S. Cl. 116—173** **8 Claims**



A flag storage and display housing having an enclosure for a flagstaff which is pivotally mounted therein for tilting movements in a vertical plane and the housing is adapted to be selectively opened to admit of tilting the staff to a selected angular position extending from the enclosure. Means are provided to frictionally secure the staff at the selected angle and other means facilitate axial rotation of the flagstaff to furl the flag thereabout preparatory to storage within the enclosure.

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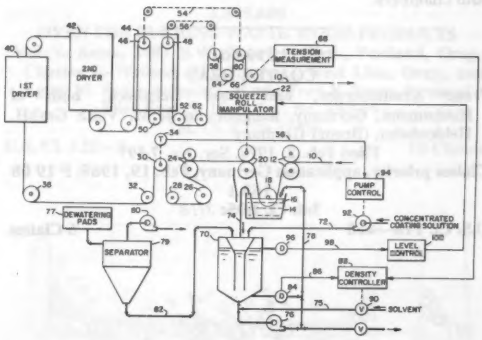
**3,599,600**
**CONTROL SYSTEM FOR COATING CONTINUOUS WEBS**
**James T. Carleton, and Richard E. Putman, both of Pittsburgh, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.**
**Filed Dec. 23, 1969, Ser. No. 887,499**
**Int. Cl. B05c** *11/10*
**U.S. Cl. 118—8** **9 Claims**




Described is a system for controlling the amount of coating per unit of area applied to a continuous web which passes through a dip tank and thence through squeeze rolls and one or more drying chambers. The system also incorporates means for controlling tension in a dried web, which tension is a function of the amount of coating applied per unit of area. The foregoing is accomplished by controlling the amount of concentrated coating solution fed to a blending tank, which supplies the dip tank, as a function of web speed; by con-

trolling the pressure exerted on the web by the squeeze rolls as a function of the liquid level in the blending tank to which excess solution from the squeeze rolls and dewatering pads is fed; and by controlling the amount of solvent for the concentrated coating solution fed to the blending tank as a function of the tension in the dried web. The invention additionally includes means for directly monitoring the density of the coating solution in the blending tank and for adjusting that density should it depart from a predetermined set value.

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**3,599,601**

**INTERNALLY HEATED AUTOCLAVE FOR METAL IMPREGNATION**

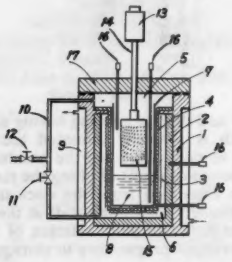
**Toshikatsu Ishikawa, Tokyo; Munenori Tomoeda, Tokyo, and Toyonosuke Kanemaru, Zushi, all of, Japan, assignors to Nippon Carbon Company, Limited, Tokoyo, Japan**

**Filed May 21, 1969, Ser. No. 826,322**

**Claims priority, application Japan, May 28, 1968, 43/35667**

**Int. Cl. C23c *1/00***

**U.S. Cl. 118—50** **3 Claims**



An internally heated autoclave includes an outer shell having therein two separate and isolated chambers. The first chamber is a heating chamber and has therein a heating means. The second chamber is an impregnating chamber and has therein an impregnating vessel adapted to contain molten metal. A dip cage containing a porous article to be impregnated by the molten metal is attached to the shaft of a lift means and is adapted to be raised and lowered in the impregnating chamber. Both of the chambers may be selectively connected to either a source of pressure or a source of vacuum. Means are provided to equalize the pressure within both chambers.

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**3,599,602**

**COATER HEAD**

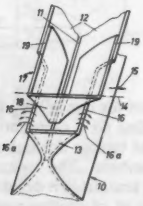
**Franz Krautzberger, and Josef Geistbeck, both of Heidenheim, Germany, assignors to J. M. Voith GmbH, Heidenheim, (Brenz) Germany**

**Filed Feb. 2, 1970, Ser. No. 7,597**

**Claims priority, application Germany, Feb. 19, 1969, P 19 08 163.1**

**Int. Cl. B05c *3/18***

**U.S. Cl. 118—410** **6 Claims**



The specification discloses a coater head for depositing coating sidewalls on webs such as paper webs. The disclosed coater head comprises a pressure container beneath the web and having a nozzle on the top extending upwardly from the container and diverging toward the web in the direction in which the web travels. The nozzle has end walls extending between the diverging sidewalls and at least one slide is mounted in the nozzle and is movable transversely of the web to vary the effective opening of the nozzle. The slide has an end wall parallel to the nozzle end wall and has at least one blade engaging one of the sidewalls of the nozzle. The nozzle wall engaged by the blade is cut off or has openings therein which are uncovered when the slide moves inwardly of the nozzle so that the coating flows from the container along the full length of the nozzle but only rises to the web over the width thereof determined by the slide adjustment. Obstruction to the flow of coating material is thereby eliminated and the formation of deposits in the container or nozzle due to obstruction of flow is eliminated.

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**3,599,603**

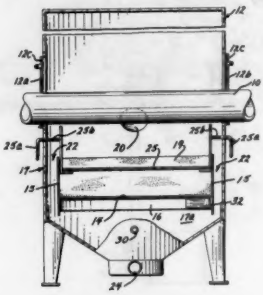
**ELECTROSTATIC COATING SYSTEM**

**Robert L. Koch, II, Evansville, Ind., assignor to Ashdie, Evansville, Ind.**

**Filed Oct. 23, 1968, Ser. No. 769,913**

**Int. Cl. B05c *5/02***

**U.S. Cl. 118—629** **3 Claims**



An electrostatic coating system characterized by a chamber containing a level of fluidized powder, an adjustable electrode for controlling the coating thickness on the part being coated and overflow weirs for controlling the level of fluidized powder with respect to such part.

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**3,599,604**

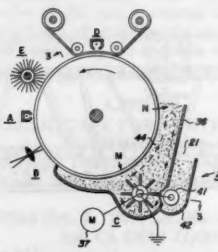
**XEROGRAPHIC DEVELOPMENT APPARATUS**

**Prabhulal P. Chawda, Rochester; John P. Caldwell, Penfield, and William E. Kramer, Ontario, all of, N.Y., assignors to Xerox Corporation, Rochester, N.Y.**

**Filed Jan. 11, 1968, Ser. No. 697,204**

**Int. Cl. B05b *5/04***

**U.S. Cl. 118—637** **1 Claim**



Apparatus for developing an electrostatic latent image on a moving photoconductive surface in which the surface is moved in contact with the two-component developer materi-

al so that an uphill flow of developer material is established therein, the apparatus having means associated therewith to aid the flow of developer material through the system.

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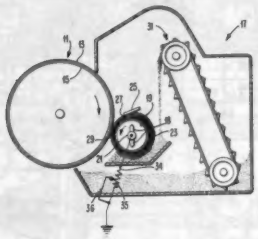
**3,599,605**
**SELF-BIASING DEVELOPMENT ELECTRODE FOR ELECTROPHOTOGRAPHY**
**James C. Ralston; Robert T. Ritchie, and Bernard G. Thompson, all of Lexington, Ky., assignors to International Business Machine Corporation, Armonk, N.Y.**
**Filed Mar. 20, 1969, Ser. No. 808,823**
**Int. Cl. G03g** *13/00*
**U.S. Cl. 118—637** **5 Claims**



A self-biasing electrode system for the development of latent electrostatic images provides low background and good solid area image fill by positioning a conductive electrode adjacent to the image surface as the image is being developed by charged making particles. The electrostatic image induces a charge on the electrode whose magnitude is controlled by grounding the electrode through an electrical impedance, for example, either a resistor along or a resistor and capacitor arranged in parallel.

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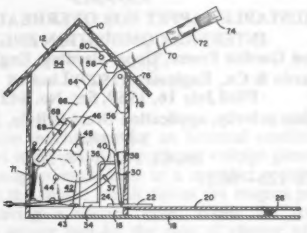
**3,599,606**
**ANIMAL-SCRATCHING DEVICE**
**David W. Hayward, 6379 Budlong Lake Ave., San Diego, Calif.**
**Filed Aug. 20, 1969, Ser. No. 851,676**
**Int. Cl. A01k** *13/00, 29/00*
**U.S. Cl. 119—1** **9 Claims**



An animal-scratching device in which an animal steps on a platform energizing a power source that moves a scratching device positioned adjacent to the platform to scratch the animal, which power source is only energized while the animal is standing on or pressing down on the platform.

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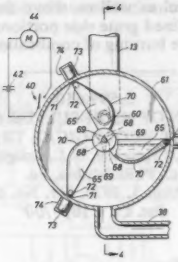
**3,599,607**
**APPARATUS FOR METERING AND SAMPLING MILK**
**Sherwin Wallick, 5120 Del Monte #9, Houston, Tex.**
**Filed Dec. 15, 1969, Ser. No. 884,865**
**Int. Cl. A01j** *07/00*
**U.S. Cl. 119—14.17** **12 Claims**

An improved metering and sampling apparatus for use with automatic milking machines. A chamber is provided with a paddle wheel which is arranged to be rotated by the flow of milk from the cow to the milking machine. Magnets may be disposed in the blades of the paddle wheel for actuating a detector or magnetically actuated switch located outside the chamber and connected to electrical counting circuitry. A separate portion of the interior of the chamber may be



located to collect a sample of the milk being taken from the cow, and means is preferably provided for retrieving the sample without interrupting the milking and metering operation.

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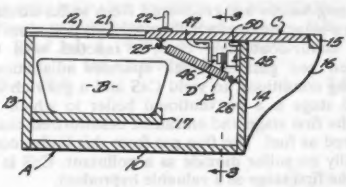
**3,599,608**
**AUTOMATIC PET FEEDER**
**Raymond D. Esquival, 11546 Rochester, Apt. #3, Los Angeles, Calif.**
**Filed Oct. 6, 1969, Ser. No. 863,798**
**Int. Cl. A01k** *05/00*
**U.S. Cl. 119—51.12** **8 Claims**



A container in which a dish of pet food can be placed, has a cover which can be manually closed to prevent access to the food until feeding time, when a time clock using household current 115 v. AC releases a latch holding the cover in closed position, whereupon a spring will retract the cover to give access to the food, and a limit switch will be opened by the cover to inactivate the latch-releasing circuit.

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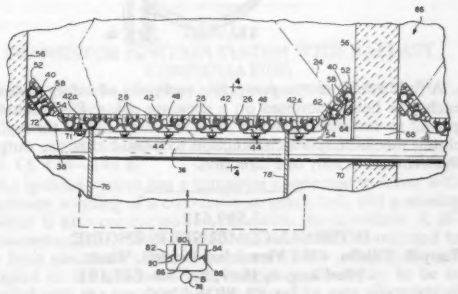
**3,599,609**
**OVEN FOR BURNING WASTE WOOD PRODUCTS**
**Fred V. Sams, 2981 S.W. Fairview Blvd., Portland, Oreg.; Charles L. Wellons, 951 7th Ave., West Linn, Oreg., and Agnes M. Sams, executrix, of said Fred V. Sams, deceased**
**Filed Sept. 5, 1969, Ser. No. 855,691**
**Int. Cl. F22b** *31/00*
**U.S. Cl. 122—2** **12 Claims**



A Dutch oven for firing a boiler with waste wood products includes refractory walls with a grate structure disposed therebetween. The grate structure comprises a plurality of

bars mounted upon water-cooled pipes and includes a central portion for principally supporting the fuel, and inclined side portions. A forced draft from underneath the grate is directed into the fuel as well as above the fuel through the aforementioned inclined grate side portions for providing turbulence and ovenfire burning of combustion products.

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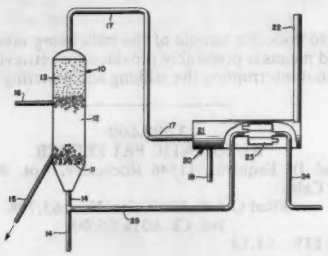
**3,599,610**

**COMBUSTION OF HIGH-SULFUR COAL WITH MINIMAL ECOLOGICAL TRAUMA**

**Marshall L. Spector, Princeton, N.J., assignor to Air Products and Chemicals, Inc., Philadelphia, Pa.**

Filed Aug. 3, 1970, Ser. No. 60,379
Int. Cl. C10j *1/00*
U.S. Cl. 122—5 10 Claims



Heating values are recovered from sulfur-containing coal in a two-stage process which minimizes pollution. In the first stage, sulfur-containing coal is reacted with CaO in a fluidized bed gasifier which operates adiabatically, under reducing conditions, to yield CaS and a gas rich in CO. The second stage is a conventional boiler to which the off-gas from the first stage and entrained desulfurized coal fines, are delivered as fuel. The flue gas from this boiler contains substantially no sulfur dioxide as a pollutant. CaS is withdrawn from the first stage as a valuable byproduct.

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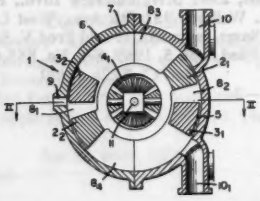
**3,599,611**

**FLUID ROTARY MOTOR AND CLUTCH MECHANISM**

**Frederic Staat, 10, rue du General Bolgert, 67 Bouxwiller, France**

Filed Feb. 14, 1969, Ser. No. 799,307
Claims priority, application France, Feb. 23, 1968, 140.969
Int. Cl. F02b *53/00*
U.S. Cl. 123—8.47 3 Claims



A fluid rotary motor comprises two pairs of rotary pistons, each pair being mounted on a separate rotor. Each rotor is geared to and coaxial with a common output shaft through a clutch mechanism which function to ensure that the output shaft rotates in only one direction.

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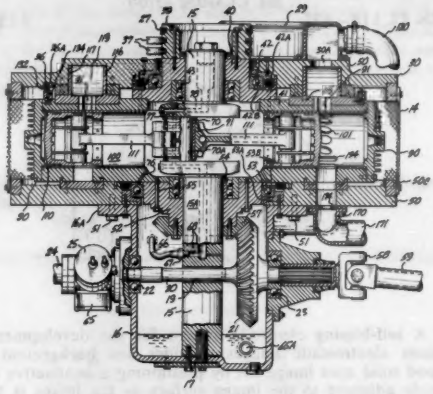
**3,599,612**

**INTERNAL COMBUSTION ENGINE**

**Tony R. Villella, 4701 Viewdrive, Everett, Wash.**

Filed Aug. 4, 1969, Ser. No. 847,181
Int. Cl. F02b *57/00*
U.S. Cl. 123—44 D 17 Claims

This application discloses a novel internal combustion engine incorporating the advantageous features of two-cycle and four-cycle engines in a single simplified engine, and also discloses the novel engine in combination with a drive assembly for utilization of the engine in an automobile. A stationary vertical crankshaft and a cylinder block disposed for rotation about the crankshaft are disclosed. Cylinder sleeves disposed in the rotatable block assembly include intake and exhaust ports which are substantially diametrically opposed with the valve action being controlled by the position of the piston within the cylinder sleeve in combination with nonrotative upper and lower intake and exhaust control casings.



Fuel as well as air for combustion and scavenging of the combustion chamber is provided through the use of a blower system cooperating with a rotating blower ring attached to the block assembly. The engine includes not only a combustion chamber associated with each piston but also a secondary burning chamber which is opened at a predetermined point in the travel of each piston so that an additional charge of oxygen is applied to the combustion chamber after the main combustion has taken place. Construction details of the complete engine, the novel power transfer assembly for driving a vehicle, and a fuel injection system are disclosed.

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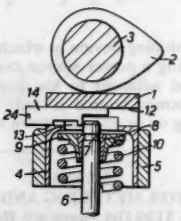
**3,599,613**

**ADJUSTABLE TAPPET FOR OVERHEAD-CAMSHAFT INTERNAL COMBUSTION ENGINES**

**Royston Gordon Freese, Upper Beeding, England, assignor to Ricardo & Co., Engineers, (1927) Limited**

Filed July 16, 1969, Ser. No. 842,103
Claims priority, application Great Britain, July 22, 1968, 34771/68
Int. Cl. F01l *1/14, 1/20*
U.S. Cl. 123—90.27 5 Claims



A valve tappet arrangement for an overhead camshaft internal-combustion engine including a tappet-setting member adapted to be inserted into an opening in the valve tappet for adjusting the effective thickness of the tappet, the tappet setting member being in the form of a self-locking pallet so that when it is fully inserted into position in the valve tappet it is locked against direct withdrawal from the valve tappet.

3,599,614

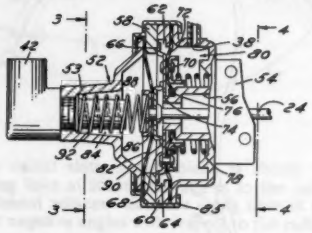
## DUAL-DIAPHRAGM DISTRIBUTOR

Frank M. Kittredge, Temperance, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Continuation of application Ser. No. 687,519, Dec. 4, 1967, now abandoned. This application Sept. 11, 1969, Ser. No. 858,567

Int. Cl. F02p 5/04

U.S. Cl. 123—117 A 8 Claims



A vacuum motor having two independently mounted and movable flexible diaphragms mounted in a common housing and partitioning the housing into fluid chambers, one of the diaphragms having a limited movement and at times limiting the movement of the other diaphragm, the other being connected to a means to be actuated; and, of which the following is a specification.

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3,599,615

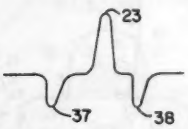
## SPARK ADVANCE MECHANISM FOR SOLID STATE IGNITION SYSTEMS

Roland J. Foreman, Franklin Park, and William J. Warner, Schaumburg, both of, Ill., assignors to Motorola, Inc., Franklin Park, Ill.

Filed May 29, 1969, Ser. No. 828,990

Int. Cl. F02p 3/04

U.S. Cl. 123—148 E 6 Claims




A spark advance mechanism for an internal combustion engine is included in a variable reluctance voltage generator comprised of a magnet embedded in a member rotating in synchronism with the engine which moves the magnet passed a sensor coil having a shaped core. When the voltage generated in the sensor coil by the rate of change of flux from the magnet rises to a given threshold amplitude it triggers an ignition circuit thereby producing a spark to ignite fuel in the engine. Spark advance is accomplished by varying the rate of change of flux through selectively shaping the portion of the core which is adjacent to the path of the magnet.

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3,599,616

## IGNITION SYSTEM FOR INTERNAL COMBUSTION ENGINES

Kazuo Oishi, and Tokuhiro Kurebayashi, both of Kariya-shi, Japan, assignors to Nippon Denso Kabushiki Kaisha, Kariya-shi, Japan

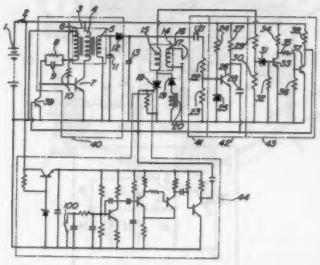
Filed July 31, 1969, Ser. No. 846,371

Claims priority, application Japan, Aug. 22, 1968, 43/60151

Int. Cl. F02p 3/06

U.S. Cl. 123—148 E 6 Claims

An ignition system of a capacitor discharging type for internal combustion engines having a DC-DC converter, a discharging capacitor, an ignition coil and a silicon-controlled rectifier. In the system, a differentiation circuit, a waveform shaping circuit and a switching element are additionally provided so that the switching element interposed in the base-emitter circuit of an oscillation transistor in the DC-DC converter is actuated by the output pulse from the waveform shaping circuit to cease the operation of the DC-DC converter for a period of time corresponding to the duration of the pulse.



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3,599,617

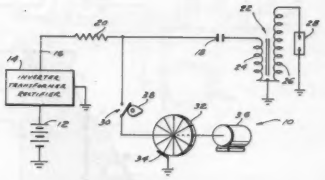
## MULTIPLE SPARK SYSTEM OF IGNITION

Glenn B. Warren, 13601 Myron St., Schenectady, N.Y.

Filed July 8, 1969, Ser. No. 839,955

Int. Cl. F02p 3/06

U.S. Cl. 123—148 E 2 Claims




An improved ignition system for an internal combustion engine is adapted to provide a series of relatively short duration sparks for ignition purposes during each successive ignition period of the engine cycle. The system in one embodiment utilizes a high speed commutator wheel adapted to interrupt the discharge of the ignition system capacitor through the primary winding of the ignition coil, thereby inducing approximately 2,000 sparks per second in the spark plug connected to the secondary winding of the coil.

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3,599,618

## TRANSISTOR IGNITION SYSTEM WITH BALLAST COMPENSATION

Gunther Schuette, Addison, Ill., assignor to Motorola, Inc., Franklin Park, Ill.

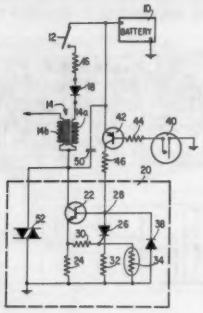
Filed May 28, 1970, Ser. No. 41,489

Int. Cl. H05b 37/02, 39/04; F02p 1/00

U.S. Cl. 123—148 E 8 Claims

An ignition system has a transistor connected in series with a primary winding of a conventional spark coil, and a sensing resistor is also connected in series with the transistor. A silicon-controlled rectifier has the anode thereof connected to the base electrode of the transistor and the cathode thereof coupled to the emitter of the transistor effectively to be in parallel with the base-emitter junction. The gate electrode of the silicon-controlled rectifier is coupled to the sensing resistor to be rendered conductive in response to a predetermined voltage level developed at the sensing resistor. The sil-

icon-controlled rectifier, when conductive, decreases the current flow through the transistor and the primary winding of




the spark coil and, when nonconductive, increases the current flow through the transistor and the primary winding of the spark coil.

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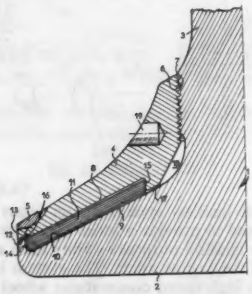
**3,599,619**

**VALVE, IN PARTICULAR EXHAUST VALVE FOR AN INTERNAL COMBUSTION ENGINE OR THE LIKE**

**Karl Kuhn, Saint-Germain-En-Laye, France, assignor to Societe D'Etudes De Machines Thermiques, Saint Denis (Seine Saint Denis), France**

**Filed Aug. 6, 1969, Ser. No. 847,900**
**Claims priority, application France, Sept. 16, 1968, 166,379**
**Int. Cl. F01l** *3/02, 3/20*
**U.S. Cl. 123—188 AA** **12 Claims**



An exhaust valve for an internal-combustion engine with a mushroom head comprising an inner heat-insulating layer of mineral material such as mica extending from a central area to the vicinity of the periphery of said head and interposed between the front end face of the head and the opposite side thereof which is provided with an annular bearing surface portion formed under said head, said heat-insulating layer having a compressive strength sufficient to transmit all the working load integrally to the valve body.

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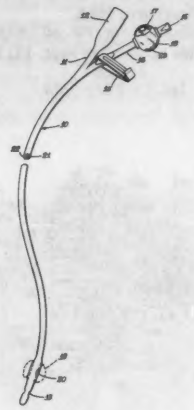
**3,599,620**

**RESILIENT RESERVOIR ASSEMBLY**

**Jay Z. Balin, Des Plaines, Ill., assignor to The Kendall Company, Boston, Mass.**

**Continuation of application Ser. No. 508,673, Nov. 19, 1965, now abandoned. This application Aug. 18, 1969, Ser. No. 852,974**
**Int. Cl. A61m** *25/00*
**U.S. Cl. 128—349 B** **6 Claims**

An inflatable retention catheter's resilient inflated reservoir retaining a fluid under pressure is enclosed by a jacket



which reduces fluid loss through the reservoir wall during storage and does not inhibit deflation of the reservoir.

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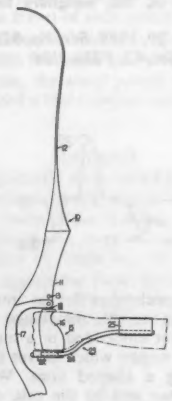
**3,599,621**

**ARCHERY BOW WITH ROTATABLE HANDGRIP**

**Delvin A. Scrobell, 3334 S. 63rd St., Milwaukee, Wis.**

**Filed Feb. 10, 1969, Ser. No. 797,898**
**Int. Cl. F41b** *5/00*
**U.S. Cl. 124—23** **4 Claims**



An archer's bow having a handle connected to the bow to permit the handle to pivot around an axis perpendicular to the longitudinal axis of the bow and rotate about an axis substantially parallel to the longitudinal axis of the bow completely independently of the bow.

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**3,599,622**

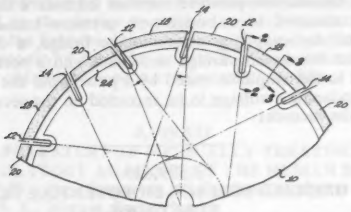
**CIRCULAR SAW CONSTRUCTION**

**Frank C. Baron, 20302 Germain St., Chatsworth, Calif.**

**Filed July 18, 1969, Ser. No. 843,034**
**Int. Cl. B28d** *1/04*
**U.S. Cl. 125—15** **4 Claims**

Slotted concrete saw blades are shown in which the edge and slot thicknesses are constituted of the combined thicknesses of layers of wear-resistant material and a core rim which is thinner than the main core body, and wherein the wear-resistant layers extend below the bottoms of the

slots. Cutting heads or segments are bonded to such composite peripheral edge surface. In various embodiments, the wear-resistant layers include portions intermediate adjacent slots which extend below the bottoms of the slots. Further, in addition to radial slots, a saw blade is shown with slots formed along lines at substantial angles to the radii, and in one embodiment adjacent slots are along lines at respective positive and negative angles with respect to the radii.



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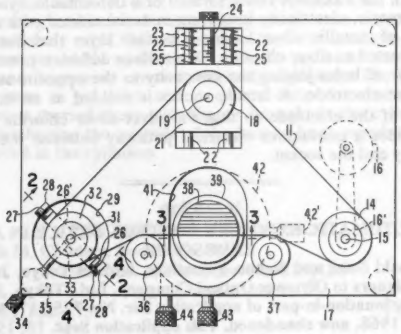
**3,599,623**

**CUTTING APPARATUS FOR MAKING FINELY CONTROLLED CUTS UTILIZING A TILTABLE WHEEL FOR REGULATING THE CUTTING BLADE MOVEMENT**

**William S. Phy, Los Altos Hills, Calif., assignor to Fairchild Camera and Instruments Corporation, Mountain View, Calif.**

**Filed Sept. 2, 1969, Ser. No. 854,478**
**Int. Cl. B28d** *1/08*
**U.S. Cl. 125—21** **1 Claim**



A cutting apparatus including a closed-loop saw blade extending around a portion of the periphery of a rotatable and tiltably mounted control wheel is disclosed. The blade is driven by a drive wheel and rotates the control wheel about its axis. The blade is moved in a cutting direction parallel to the plane of the blade by tilting the control wheel, the tilting motion providing very accurate control of the cutting depth of the blade. The blade is tensioned by a third wheel.

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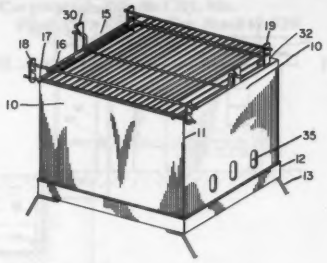
**3,599,624**

**ROTATABLE BARBECUE GRILL**

**Emil Gehring, 114 S. Second Ave., Wausau, Wis.**

**Filed July 8, 1969, Ser. No. 839,987**
**Int. Cl. A47j** *37/00;* **F24b** *3/00*
**U.S. Cl. 126—25 R** **3 Claims**

The invention described herein is a highly functional, portable barbecue grill having a grill mounted on a fire box in such a manner to be easily rotatable to readily expose the opposite sides of the grill to the barbecue fire. The invention described and illustrated herein is comprised of a base member having supporting legs extending therefrom, collapsible plates to set on the base member and function as the sidewalls of the fire box of the barbecue, and a grill mounted in receiving slots extending from the sidewalls.



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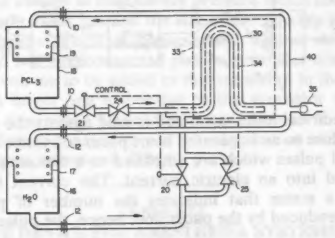
**3,599,625**

**DEEP SUBMERGENCE HEATING SYSTEM**

**Daniel L. Curtis, Manhattan Beach, Calif., assignor to Litton Systems, Inc., Beverly Hills, Calif.**

**Filed May 19, 1969, Ser. No. 825,813**
**Int. Cl. F24j** *1/00*
**U.S. Cl. 126—204** **7 Claims**



An underwater heating system for a swimmer or diver operating at deep submergence in cold water for extended periods of time. Heat is provided to the swimmer by an exothermic chemical reaction of phosphorous trichloride and water reacting within a continuous heating tube located underneath a swimer's diving suit or within an underwater chamber. The heat provided is controlled by regulating the amount of chemicals reacting and safety valves are provided to stop the reaction at any time.

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**3,599,626**

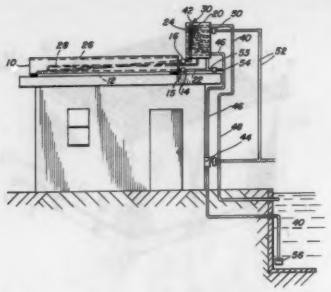
**SOLAR HEATER FOR SWIM POOLS**

**Clyde W. Bouse, Clearwater, Fla., assignor to Richard D. Wachtler, Clearwater, Fla., a part interest**

**Filed Nov. 12, 1969, Ser. No. 875,913**
**Int. Cl. F24j** *3/02*
**U.S. Cl. 126—271** **2 Claims**

A closed circuit solar water heater in which a sun heated fluid is gravitationally circulated to and from a heat exchanger and control unit in the form of a tanklike receptacle for heating an independent water system circulating through a pipe coil within the said receptacle, the solar heater including coils of copper tubes leading from the bottom of the heat exchanger and control unit and disposed to be heated by sun rays, the said coils receiving the fluid to be heated and then returning the heated fluid into the heat exchanger and control unit near the top thereof for gravitational circulation therethrough, and pump means controlled

by the control unit for causing flow of water through the said independent water system and operable only when the temperature of the sun heated fluid in the control unit is above a predetermined level.



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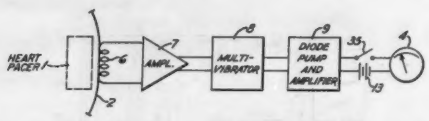
**3,599,627**

**METHOD AND INSTRUMENT FOR DETERMINING THE PULSE RATE OF A PERSON WITH AN IMPLANTED HEART PACER**

**John Eugene Millen, 1521 Pacific Ave., Natrona Heights, Pa.**

**Filed Jan. 9, 1969, Ser. No. 790,052**
**Int. Cl. A61b** *5/02*
**U.S. Cl. 128—2.05 R** **2 Claims**




An electrical inductance coil is held against the chest of a person close to an implanted heart pacer to induce in the coil electrical pulses which are amplified to a common level and converted into an electric current. The current is used to operate a meter that indicates the number of pulses per minute produced by the pacer and, hence, the pulse rate.

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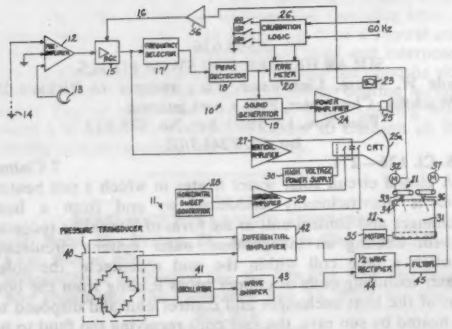
**3,599,628**

**FETAL HEART RATE AND INTRA-UTERINE PRESSURE MONITOR**

**Thomas J. Abbenante, Branford; Victor H. Giesler, Wallingford; Robert E. Montgomery, Northford, and Gerhard T. Weiss, Northford, all of, Conn., assignors to Corometrics Medical Systems, Inc., North Haven, Conn.**

**Filed May 3, 1968, Ser. No. 726,428**
**Int. Cl. A61b** *5/04*
**U.S. Cl. 128—2.06 F** **31 Claims**




This disclosure relates to a device for monitoring fetal heart beat and intrauterine pressure and correlating the same to determine fetal distress.

The fetal heart rate monitor employs a photoelectric AGC circuit, a frequency selector producing a ringing output at the dominant frequency of the fetal EKG complex, digital counters to measure the interval between successive heart beats, a digital-to-analog converter and a two-channel recorder.

The intrauterine pressure monitor features a liquid-filled tube connected to a bridge-type pressure transducer, an oscillator for supplying power to the bridge, a differential amplifier for sensing bridge unbalance and a rectifier connected to the amplifier, gated by a pulse from the oscillator and producing a voltage to be recorded on the second channel of the recorder.

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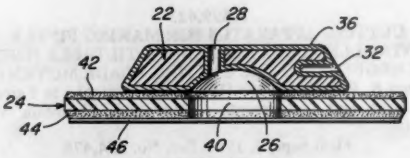
**3,599,629**

**OXIDIZED SURFACE BIOPOTENTIAL SKIN ELECTRODE**

**Edwin Gordy, Newtonville, Mass., assignor to Lexington Instruments, Waltham, Mass.**

**Filed Aug. 28, 1968, Ser. No. 755,872**
**Int. Cl. A61f** *5/04*
**U.S. Cl. 128—2.06 E** **11 Claims**




An electrode adapted to be attached to the skin of an individual for obtaining a biological or physiological potential such as are associated with muscle activity or functions of the brain, the electrode being formed of a deformable, synthetic polymeric, electrically insulating material coated with a thin film of metallic silver having a surface layer that has been converted to silver chloride. One surface defines a concavity, a pair of holes joining the concavity to the opposite surface of the electrode. A female socket is molded as an integral part of the electrode so that the silver-silver chloride layer provides a continuous electrical pathway between the concavity and the socket.

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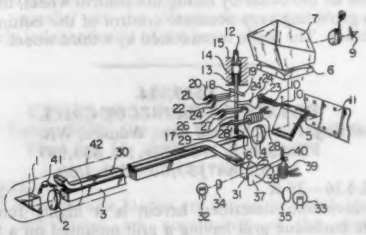
**3,599,630**

**AUTOMATIC EXPOSURE CONTROL DEVICE IN AN ENDOSCOPE**

**Masaaki Sato, and Nobuo Yamashita, both of Tokyo, Japan, assignors to Olympus Optical Company, Ltd., Tokyo, Japan**

**Continuation-in-part of application Ser. No. 725,317, Apr. 30, 1968, now abandoned. This application Sept. 15, 1969, Ser. No. 866,412**
**Claims priority, applications Japan, May 4, 1967, May 4, 1967, May 4, 1967, Sept. 21, 1967, Apr. 10, 1968, Oct. 15, 1968, 42/36882, 42/36883, 42/36884, 42/80172, 43/28346, 43/74605**
**Int. Cl. A61b** *1/04*
**U.S. Cl. 128—6** **15 Claims**



Automatic exposure control device in an endoscope adapted to photograph an object illuminated by the light

emanating from the forward end of a light conducting optical system which extends in the endoscope and receives light from an external light source at its rearward end on a film loaded in the endoscope, the light from the object being transmitted through an image transmitting optical system of the endoscope. The light quantity for photographing the object is controlled by means of an exposure control circuit provided in the device to which a photoelectric element receiving the light from the object supplies a signal indicative of the intensity of the light incident to the photoelectric element for obtaining the proper exposure of the film.

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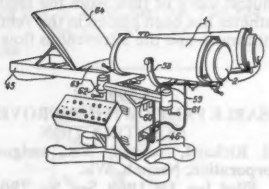
**3,599,631**
**APPARATUS FOR MEDICALLY TREATING CIRCULATORY AILMENTS OF THE HUMAN BODY**
**Winfried Werding, Lausanne, Switzerland, assignor to Contimed S. A., Morges, Switzerland**
**Filed July 18, 1969, Ser. No. 843,010**
**Claims priority, application Switzerland, Nov. 26, 1968, 17,587/68**
**Int. Cl. A61h *21/00***
**U.S. Cl. 128—24.2** **17 Claims**



An apparatus for the treatment of circulatory ailments comprises two enclaves in the form of cylinders each having a vibrating cushion and carried by pairs of arms secured to an oscillatory table. Means are provided for oscillating the oscillatory table in synchronism with the cycles of compression and depression created within the cylinders. The cylinders have a gas inlet and a quartz lamp for destroying microbes carried along with the air brought in the cylinders for disinfecting the wounds of the human body members introduced in the cylinders.

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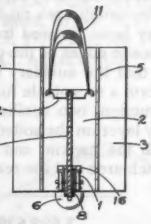
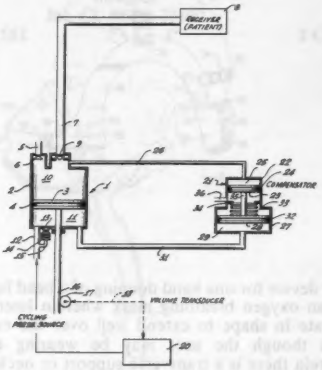
**3,599,632**
**PORTABLE TRACTION STAND**
**Frank M. Childers, Rockledge, Fla.**
**Filed Apr. 3, 1969, Ser. No. 827,438**
**Int. Cl. A61h *1/02***
**U.S. Cl. 128—75** **1 Claim**



Portable traction stand comprises hinged frame formed of rigid material, horizontal base portion, hinged at two points, with hinged vertical member accommodating adjustable pulley assembly. Device freely slidable as a unit along the entire width of patient's bed between mattress and springs without otherwise attachment thereto, with rigidity of mattress and patient's weight assisting in holding mechanism in place during application of human body traction.

**3,599,633**
**VOLUME-LIMITED VENTILATOR WITH COMPLIANCE COMPENSATOR**
**Noel F. Beasley, Santa Monica, Calif., assignor to Puritan-Bennett Corporation, Kansas City, Mo.**
**Filed Apr. 7, 1969, Ser. No. 813,829**
**Int. Cl. A61m *16/00***
**U.S. Cl. 128—145.6** **19 Claims**



The volume of gas delivered to a patient by a volume-limited ventilator is maintained substantially constant, regardless of change in the delivery pressure which changes the compression of the gas and the size of the delivery tubing, by a compensator which is spring-biased against its delivery stroke and has interconnected pistons, a smaller one delivering a gas volume to be added to that measured in the ventilator and a larger one responsive to the ventilator operating pressure. As a result, the compensator increases the amount of gas delivered to compensate for compression and tube expansion upon increase in delivery pressure.

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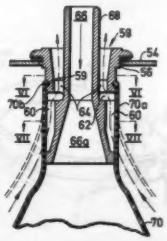
**3,599,634**
**VALVE DEVICE FOR ANESTHESIA SYSTEMS AND RESPIRATORS**
**Soren H. Englesson, Uppsala, Sweden, assignor to Sixten Englesson Teknisk Konsult Aktiebolag, Solna, Sweden**
**Filed Jan. 23, 1969, Ser. No. 793,267**
**Claims priority, application Sweden, Feb. 1, 1968, 1358/68**
**Int. Cl. A61m *17/00***
**U.S. Cl. 128—145.7** **11 Claims**



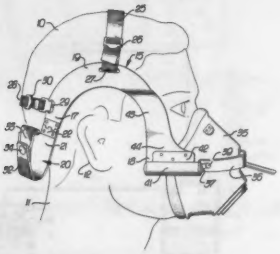
A valve device specifically for anesthesia systems and respirators, etc., comprising a check valve in a one-way system conveying breathing air to and from a patient as well as additional components, if desired, such as oxygen and/or anesthetic agent. The valve utilizes a balloon or bladder which releases the system air etc. to the outside through an appropriately designed balloon support when an overpressure occurs in the balloon as the result of excess pressure of said system air etc.

3,599,635

## HANGING QUICK DONNING MASK SUSPENSION

William Kenneth Ansite, Altadena, Calif., assignor to Sierra Engineering Co., Sierra Madre, Calif.

Filed Mar. 12, 1969, Ser. No. 806,603
Int. Cl. A62b 9/04
U.S. Cl. 128—146.7 7 Claims



A device for one hand donning of a head harness suspending an oxygen breathing mask wherein lateral supports are arcuate in shape to extend well over the ears of the user, even though the user may be wearing earphones, and wherein there is a transverse support or neck piece attached to the rear ends of the lateral support by hinges, the pivot axes of which are disposed at such an angle that the lateral supports can fold toward each other in a flat package and which when opened will assume positions adapted to readily fit over the head. The suspension is adjustable to size by a crown strap attached to midportions of the lateral supports and a rear strap which extends from the crown strap to a point of attachment with the transverse support. The front ends of the lateral support are pivotally connected to the mask so that when collapsed the mask will assume a tilted position improving the compactness of the package but capable of tilting to a proper operating position when the mask is donned.

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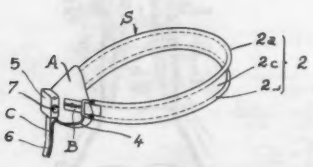
3,599,636

## INFLATABLE HEAD HARNESS FOR RESPIRATOR DEVICES

Georges M. Gutman, Palaiseau, and Raymond H. Beaussant, Bretigny, both of, France, assignors to Intertechnique, Plaisir, France

Continuation of application Ser. No. 646,678, June 16, 1967, now abandoned. This application Dec. 12, 1969, Ser. No. 880,509
Int. Cl. A62b 18/08
U.S. Cl. 128—146.7 6 Claims



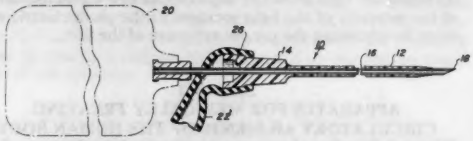
An inflatable head harness to rapidly fit and carry a face mask. The harness has two inflatable elastic tubes closed at one end and opened at the other end. A sheath of limited yieldability encircles the tubes and acts to restrain their expansion when inflated. When in the inflated state, the harness is placed over the head of a user and then deflated to fit the user's head. A valve is connected to the opened ends of the tubes to control the inflation and deflation of the harness by exposing the opened ends to a fluid source or ambient air, respectively.

3,599,637

## INTRAVENOUS CATHETER ASSEMBLY

Boris Schwartz, 400 Park Ave., Paterson, N.J.

Filed May 12, 1969, Ser. No. 823,739
Int. Cl. A61m 5/00
U.S. Cl. 128—214.4 4 Claims



An intravenous catheter comprises a flexible self-sealing tubular portion adjacent a catheter member. This tubular portion is bendable from a normal axis of the catheter so that a needle may be inserted through the bent over sleeve and then through the catheter member. The other end of the tubular portion is disposed for connection to an intravenous feeding system. The needle, when inserted into the catheter, acts as a shutoff valve of flow from the feeding system until after the catheter has been placed in the vein, whereupon the needle is withdrawn and the intravenous flow is commenced.

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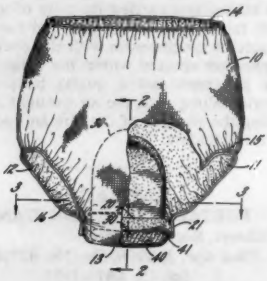
3,599,638

## DISPOSABLE PANTY WITH IMPROVED CROTCH CONSTRUCTION

Charlotte I. Rickard, Neenah, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.

Filed Jan. 10, 1969, Ser. No. 790,397
Int. Cl. A61f 13/16
U.S. Cl. 128—288 1 Claim



A disposable panty having an improved crotch construction which at least one auxiliary layer of absorbent material is disposed over the crotch area on the inner surface thereof, with the auxiliary layer secured to the body portion of the panty at the opposite edges of the crotch area formed by the leg openings so that the auxiliary layer cooperates with the crotch area to form a receptacle for a sanitary napkin. In the preferred construction, two auxiliary layers are provided so that the auxiliary layer on the soiled side of a first napkin can be removed with the napkin, and the next napkin inserted between the crotch area and the remaining auxiliary layer.

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3,599,639

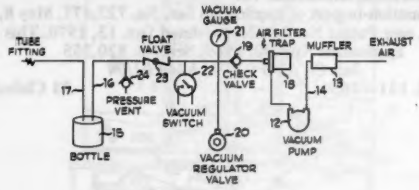
## PORTABLE SUCTION PUMP SYSTEM

Donald R. Spotz, Cleveland, Ohio, assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Aug. 20, 1969, Ser. No. 851,686
Int. Cl. A61m 1/00
U.S. Cl. 128—276 7 Claims

A portable suction or vacuum pump system especially for medical use, which meets the requirements of pharyngeal and tracheal suctioning (high suction, low flow), gastric decompression or stomach pumping (moderate suction, low

flow and cyclic operation), and pleural suctioning (low suction, high flow). Operation is by batteries, external DC or external AC by use of a power converter. A vacuum regulator and pump characteristics permit the various combinations of suction and flow.

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**3,599,640**

## DISPOSABLE UNDERGARMENT WITH ABSORPTION PAD

**Phyllis M. Larson, 7116 Thrasher Road, McLean, Va.**

**Filed Dec. 2, 1968, Ser. No. 780,324**
**Int. Cl. A61f** *5/44*
**U.S. Cl. 128—286** **8 Claims**

A disposable waist-supported garment to be worn next to the skin, e.g., panty, bikini, crotch guard, men's supporter, the garment optionally including an integral absorbent crotch pad. The garment is made of a nonwoven (e.g., paper or paperlike) material with a sufficient amount of thermoplastic material such as polyester or polyethylene sprayed or otherwise incorporated into it so that the component parts of the garment can be heat-formed and heat-sealed, with the edges at the leg and waist portions V-crimped to form a ribbed edge effect with is sufficiently stretchable to sit securely against the body of the user. The chief contemplated uses for such garments are for menstrual use, incontinence, baby diapers, etc.

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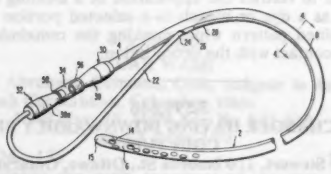
**3,599,641**

## COMBINATION CONNECTOR AND CHANNEL CLOSURE SYSTEM FOR CATHETERS

**David S. Sheridan, Hook Road, Argyle, N.Y.**

**Filed Mar. 13, 1970, Ser. No. 19,230**
**Int. Cl. A61m** *25/00*
**U.S. Cl. 128—348** **2 Claims**



A combination connector and channel closure system for multilumen catheters comprises two connector members, each having a female portion connected to a catheter channel and a male portion on the opposite end, the male portions being joined by a short section of flexible plastic tubing forming a releasable seal for the plural channels of the catheter.

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**3,599,642**

## ENDOTRACHEAL TUBES

**Roland L. Tindel, 846 Oak Valley, Houston, Tex.**

**Continuation of application Ser. No. 624,455, Mar. 20, 1967, now abandoned. This application Dec. 29, 1969, Ser. No. 888,145**
**Int. Cl. A61m** *25/00*
**U.S. Cl. 128—351** **2 Claims**

Disposable endotrached tubes are provided, such tubes having an adapter portion integral with a body portion through a juncture, with a lumen of substantial constant diameter extending throughout the body portion and juncture, the lumen opening into the adapter through a region of generally nonturbulent flow. In one embodiment, the juncture portion is corrugated to provide a flexible connection at any desired angle between adapter and body portion.

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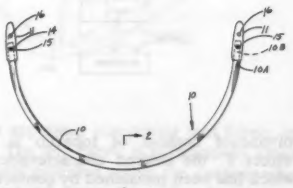
**3,599,643**

## BRASSIERE FRAME

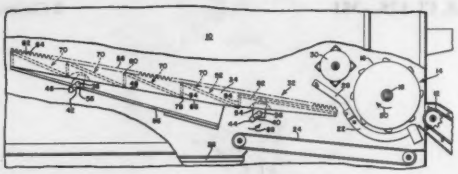
**Marcus Schwartz, Forest Hills, N.Y., assignor to S. & S. Industries, Inc., Bronx, N.Y.**

**Filed Apr. 3, 1969, Ser. No. 813,224**
**Int. Cl. A41c** *1/16*
**U.S. Cl. 128—465** **6 Claims**



This disclosure is directed to an arcuate brassiere wire or frame for framing the lower circumferential portion of a brassiere cup to more firmly support the breasts of a wearer. The frame is formed of a flat stock material the ends of which are provided with a protective cover specifically constructed and arranged to protect against wearing through the fabric of the brassiere and to facilitate the sewing of the frame in place in the brassiere cup.

3,599,644
STRAW WALKER FOR A COMBINE
Darwin Bichel, and Robert L. Malcolm, both of East Moline, Ill., assignors to Deere & Company, Moline, Ill.
Continuation of application Ser. No. 470,807, July 9, 1965, now abandoned. This application June 25, 1968, Ser. No. 751,019
Int. Cl. A01f *12/30*
U.S. Cl. 130—26 7 Claims



A straw walker mounted in a combine rearwardly of the threshing cylinder for receiving grain and straw therefrom. The straw walker oscillates in a fore-and-aft direction to agitate the material, moving the straw out the rear of the combine while permitting the grain to drop through. The walker has opposite fore-and-aft extending side panels with linear, saw-toothed upper edges, and a stepped bottom, each step having a large number of apertures through which the grain drops.

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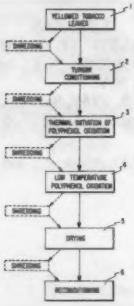
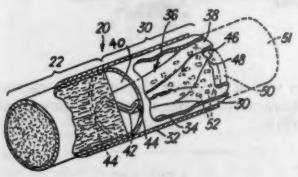
3,599,645
TREATMENT OF TOBACCO TO REDUCE POLYPHENOL CONTENT
William H. Johnson, Raleigh, N.C., assignor to Research Corporation, New York, N.Y.
Filed Mar. 18, 1969, Ser. No. 808,146
Int. Cl. A24b *15/02*
U.S. Cl. 131—140 8 Claims



The polyphenol content of tobacco is reduced with minimal effect F. the desired characteristics of the final tobacco which has been moistened by contact with water or water vapor so that the moisture content of the said tobacco is at least 70 percent and is product by subjecting tobacco which has been moistened by contact with water or water vapor so that the moisture content of the said tobacco is at least 70 percent and is in the yellowed state to a short term of heating between about 140° and about 180° F. to initiate oxidative browning and thereafter holding the tobacco at a temperature between about 70° and about 110° F. until a major portion of the polyphenol content thereof is enzymatically oxidized. The heating may be effected by infrared radiation or by contacting the tobacco with hot gases or hot water. The tobacco may be treated either in whole leaf or in shredded form.

3,599,646
CIGARETTE FILTER
Richard M. Berger, Richmond, and Elwin W. Brooks, Mechanicsville, both of, Va., assignors to American Filtrona Corporation, Richmond, Va.
Continuation-in-part of application Ser. No. 727,477, May 8, 1968, now Patent No. 3,533,416, dated Oct. 13, 1970. This application Apr. 30, 1969, Ser. No. 820,355
Int. Cl. A24f *07/04*; A24d *01/04*
U.S. Cl. 131—265 31 Claims



A cigarette filter means is constructed to provide a pair of elongated, high surface area, cavities defined on opposite sides of a relatively thin wall formed of filtering material. Preferably, only the ends of the filter means contact an overwrapped outer tube which provides maximum available surface area to provide a filter element with a relatively high filtration efficiency and satisfying ordinary commercial standards regarding "taste," pressure drop and manufacturing cost. The filter comprises an outer elongated member in which an inner crimped filter is disposed. The latter has major portions of the outer surface spaced from the inner surface of the outer member to define cavity means therebetween into which the smoke is compelled to pass.

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3,599,647
HAIR TREATING APPLIANCE
Vittorio Fabbri, 8411 Crystal Springs, Woodstock, Ill.
Filed Oct. 8, 1969, Ser. No. 864,645
Int. Cl. A45d *19/00*
U.S. Cl. 132—9 6 Claims

An appliance to be used in the treatment of human or artificial hair to restrict the application of a treating composition such as a dye or bleach to a selected portion having a predetermined pattern while masking the remainder of the hair from contact with the composition.

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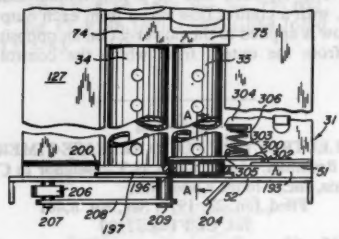
3,599,648
COIN CHANGER HAVING DOWNWARDLY BIASED COIN TUBE
Wilson M. Stewart, 110 Isabella St., Ottawa, Ontario, Canada
Filed Aug. 21, 1969, Ser. No. 851,930
Int. Cl. G07d *1/00*
U.S. Cl. 133—5 4 Claims

In a coin changer having a dime-storage tube and an apertured plate reciprocable below said tube to receive a dime in its aperture and deliver the dime to a change chute, a bush-

ing is provided around the lower end of the tube and the bushing is spring-urged down into contact with the upper surface of the apertured plate so as to restrain the dime above the dime in the aperture from movement with the plate.

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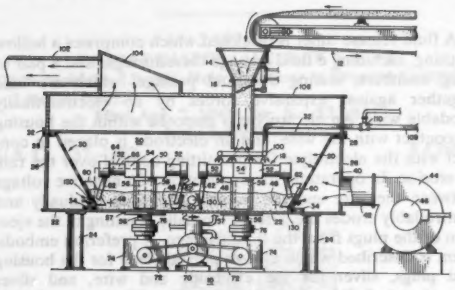
**3,599,649**

## APPARATUS FOR COOLING GRANULAR MATERIAL

**Elbert C. Troy, Highland Park, Ill., assignor to National Engineering Company, Chicago, Ill.**

**Filed Apr. 10, 1969, Ser. No. 815,008**
**Int. Cl. B08b** *3/00*
**U.S. Cl. 134—57** **5 Claims**



A continuous system for cooling hot granular material comprising a treatment chamber having upwardly extended sidewalls formed of electrically insulating material and an inlet and outlet. Means is provided for moving the material from the inlet toward the outlet during the cooling process and water supply means is provided for adding moisture to the material in the chamber for evaporative cooling of the material. Means is provided for regulating the water supply means to control the rate of water added to the material in response to the condition of the incoming material, and the regulating apparatus includes at least one pair of sensing electrodes which are mounted on the insulating sidewall of the chamber for sensing the moisture condition of the granular material in the chamber. The addition of moisture from the water supply means is regulated in response to the detected moisture condition.

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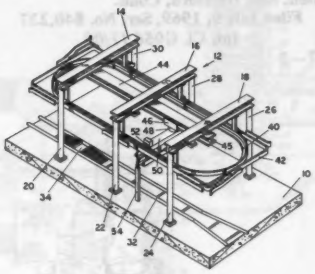
**3,599,650**

## CAR WASH

**James M. Abraham, Gahanna, Ohio, assignor to Auto Magic Car Wash Corporation, Columbus, Ohio**

**Filed Mar. 28, 1969, Ser. No. 811,428**
**Int. Cl. B60s** *3/04*
**U.S. Cl. 134—123** **22 Claims**

An automatic car wash apparatus of the type having a spray bar mounted on a movable carriage which is driven on an endless carriage track around a parked automobile and which as it is driven sprays cleaning fluids and rinse water on the automobile in a selected sequence is disclosed. The endless carriage track is positioned above and around the parked automobile. The carriage is driven around the carriage track by a motor which is mounted on a motor dolly, the motor dolly being slidable along a substantially central linear track. An endless cam track surrounds the carriage track and is in cam relationship with the spray bar. The cam track serves to slide the spray bar inwardly and outwardly relative to the carriage track in order to position the spray bar the proper distance from the parked car. The vertical member of the spray bar is rotatable about its vertical axis and is rotated by another cam follower in cam relationship to the cam track so that the spray from the vertical spray bar is always maintained approximately perpendicular to the side of the car being cleaned. The spray is preferably maintained at a slight leading angle to the perpendicular. A fluid conducting swivel is disclosed having not only a stationary member with an input port and a rotatable member with an output port, the ports being in fluid communication, but also having a coaxial passageway through it through which the motor shaft can extend and transmit mechanical power from the motor to the carriage.



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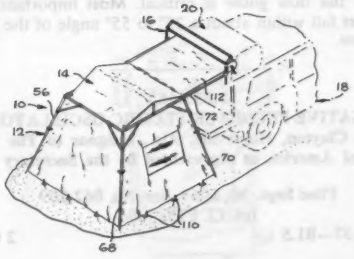
**3,599,651**

## PORTABLE TENT APPARATUS

**Sidney L. Perry, 5145 Kelvin Ave., Woodland Hills, Calif.**

**Filed June 17, 1969, Ser. No. 834,000**
**Int. Cl. A45f** *1/00, 1/16*
**U.S. Cl. 135—1 A** **11 Claims**



Portable tent apparatus comprising tent fabric, tent poles and a canister. The tent fabric is permanently attached to a roller permanently mounted within the canister whereby the tent fabric is wound upon the roller for storage in the canister and is unwound therefrom for setting up the tent. The poles are collapsible for storage within the canister and rapidly extendable for setting up the tent. The poles and canister combine to form a unitary structure for support of the tent fabric. The canister is horizontally extendable from the poles for mounting attachment of the canister upon an external structure, such as a vehicle, to provide a tent fabric canopy in interconnecting covering relationship between the erected tent and the vehicle. Height adjustment means are provided for varying the vertical displacement of the canister relative to the erected tent poles to accommodate variations

in vehicle height or other location attachment of the canister to the vehicle or other external structure. The canister, with the poles and fabric stored therein, may be transported in attached relationship to the vehicle, and tent erection may be accomplished without removal of the canister from the vehicle.

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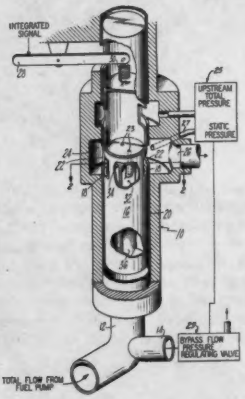
**3,599,652**

## FLOW DIVIDER FOR THROTTLES

**Melvin L. Perkins, Long Meadow, Mass., and Robert Sherman, West Hartford, Conn., assignors to United Aircraft Corporation, East Hartford, Conn.**

**Filed July 9, 1969, Ser. No. 840,237**
**Int. Cl. G05d *11/00***
**U.S. Cl. 137—2** **7 Claims**




A device is disclosed for reducing flow distortion in a fuel control throttle valve consisting essentially of a flow guide disposed within a throttle valve. The flow guide reduces the effects of random turbulence and flow distortion associated with high fuel-flow velocities and small radius turns in the flow ducting in miniaturized housing controls. Practical design of the flow guide is critical. Most importantly, the guide must fall within about a 25° to 55° angle of the metering window.

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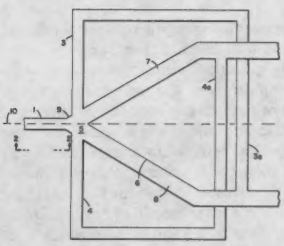
**3,599,653**

## NEGATIVE FEEDBACK FLUIDIC OSCILLATOR

**Bobby J. Clayton, Huntsville, Ala., assignor to The United States of America as represented by the Secretary of the Army**

**Filed Sept. 30, 1969, Ser. No. 862,209**
**Int. Cl. F15c *1/08***
**U.S. Cl. 137—81.5** **2 Claims**



A supersonic fluid power-jet flows into an overexpanded divergent nozzle. A control flow against one side of the jet splits, passes around, and impinges on the opposite side of the jet. The jet therefore is deflected in the direction from whence the control flow came, rather than being deflected in the normal opposite direction. Two output passageways are provided, one on each side of a longitudinal axis of the power-jet, with a control flow taken from each output. Each control flow is applied to the power-jet on an opposite side of the axis from the output from which the control flow is taken.

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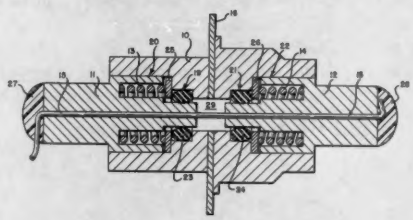
**3,599,654**

## ELECTROLYTIC FLUID RELEASE TIMER

**Curtis C. Beusman, Mount Kisco, N.Y., assignor to Curtis Instruments, Inc., Mount Kisco, N.Y.**

**Filed Jan. 28, 1970, Ser. No. 6,401**
**Int. Cl. F16k *31/00***
**U.S. Cl. 137—67** **5 Claims**



A fluid release timer is disclosed which comprises a hollow housing, including a fluid passage therethrough, and a pair of plug members, sealing the fluid passage, which are held together against expansive forces by an electrolytically erodable wire. An electrolyte is disposed within the housing in contact with the wire, and an electrode is placed in contact with the electrolyte for permitting control over the rate of erosion. In operation, the application of a negative voltage between the wire and the housing electrode gradually and controllably erodes the wire—eventually resulting in the ejection of the plugs from the fluid passage. A preferred embodiment is described which utilizes polyethylene for the housing and plugs, silver for the electrode and wire, and silver fluoroborate for the electrolyte. In order to increase reliability, the longitudinal thickness of the housing electrode is made small compared to the length of the wire.

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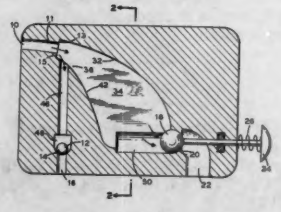
**3,599,655**

## AUTOMATIC REFILL DEVICE HAVING FLUIDICALLY OPERATED CONTROL

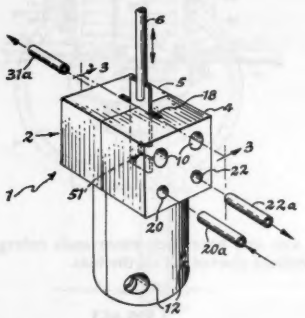
**Theodore J. Fussell, Bound Brook, N.J., assignor to American Standard Inc., New York, N.Y.**

**Filed Oct. 28, 1968, Ser. No. 771,065**
**Int. Cl. F15c *3/06, 1/04***
**U.S. Cl. 137—81.5** **23 Claims**



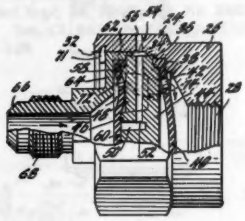
A refill mechanism, for example, a water closet tank refill apparatus, having a valve which maintains itself in the "on" position once the fluid flow starts and switches to the "off" position in response to the attainment of a predetermined liquid level.

3,599,656
VARIABLE FLUID TRANSDUCER
Charles R. Pettis, Jr., Ithaca, N.Y., assignor to Hi-Speed Checkweigher Co., Inc., Ithaca, N.Y.
Filed Nov. 19, 1968, Ser. No. 777,071
Int. Cl. F15b 5/00, 13/02; G05d 16/00
U.S. Cl. 137—83 9 Claims



A variable fluid transducer adapted to produce a fluid output signal which is variable with respect to the position of a core freely movable within the transducer.

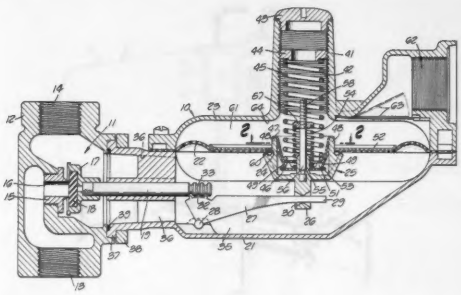
3,599,657
DOUBLE DIAPHRAM CHECK VALVE
Ojars Maldavs, Lincoln, Nebr., assignor to Bruning Company, Lincoln, Nebr.
Filed Apr. 7, 1969, Ser. No. 822,811
Int. Cl. G05d 7/00
U.S. Cl. 137—102 5 Claims



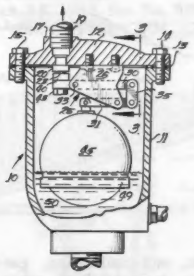
A double elastic diaphragm check valve for dealing with a liquid on the upstream side and liquid and gas on the downstream side is provided. None of the metallic parts move, avoiding frictional wear nor are there metal parts subject to stress corrosion. The structure is free of internal threads and other crevices susceptible of retaining dirt or other foreign matter. In normal operating sequence and even simple abnormalities the valve vents only gas avoiding liquid spillage.

3,599,658
PRESSURE REGULATOR WITH INTERNAL RELIEF VALVE
Harold F. Kruzan, Yorba Linda, and Dwight N. Johson, Anaheim, both of, Calif., assignors to American Meter Company, Philadelphia, Pa.
Filed July 28, 1969, Ser. No. 845,281
Int. Cl. G05d 11/00; F16k 31/12
U.S. Cl. 137—116.5 7 Claims

A pressure regulator has a flexible diaphragm connected through a pivoted lever to operate a main valve between an inlet and an outlet. The outlet communicates with a chamber below the diaphragm. The diaphragm has a central opening closed by a relief valve having a valve head engaging the diaphragm. The valve head has a central stem and a plurality of posts circumferentially spaced about the stem all projecting through apertures in the central portion of a diaphragm stiffener. The main load spring acts through an annular cup to apply a downward force to the posts and relief valve head to cause the lever to open the main valve. The annular cup engages a bonnet to limit upward overtravel of the relief valve head in event of failure of the lever or its connections. A relief valve spring encircling the stem within the load spring acts against the diaphragm stiffener so that the diaphragm moves upward away from the relief valve head against the force of the relief valve spring only, upon overpressure in the chamber when either the lever or the bonnet limits upward movement of the relief valve head. This construction separates the main load spring from the relief valve function, for closer control of relief pressure where higher outlet pressures are required. Adjustable means on the stem is provided to vary the force of the relief valve spring, and adjustable means in the bonnet is provided to vary the force of the load spring.



3,599,659
AIR RELEASE VALVE
Andrew G. Nuter, 1055 N. Massasait, Chicago, Ill., and Theodore Mackowan, 1522 N. 24th Ave., Melrose Park, Ill.
Filed Apr. 6, 1970, Ser. No. 25,912
Int. Cl. F16k 45/02, 31/24
U.S. Cl. 137—202 7 Claims



A valve casing includes a top plate which provides a release orifice and a lower inlet aperture communicating with pressurized liquid from which entrained air is to be released. A metallic float having a peripherally depending skirt is located over the inlet aperture; and the float is connected to a compound lever linkage, the other end of which supports a closure member adapted to seal the release orifice when the liquid level in the housing exceeds a predetermined level or when the inrush of water engages the peripheral skirt of the float to force it upward. The compound lever linkage includes upper and lower lever arms pivotally mounted in a cradle bracket secured to the top plate within the chamber. The closure member is adjustably mounted to the upper lever arm to insure proper sealing. The same arrangement may be used for a wide range of fluid pressure; and it permits fabri-

cation using all stainless steel parts except for the housing and closure member without the need of castings.

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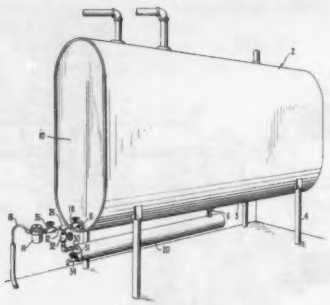
**3,599,660**
**CONDENSATION TRAP FOR TANKS**
**Paul L. Stickney, R.F.D. #1, Bridgton, Maine**
**Filed Oct. 1, 1968, Ser. No. 764,163**
**Int. Cl. B65d** *25/00*
**U.S. Cl. 137—203** **1 Claim**



Attached by a fitting beneath a drain outlet in the bottom of a fuel storage tank is an elongate cylindrical condensation trap. The trap is also attached by a fitting to a standard fuel outlet pipe. The fittings include shutoff valves, and a drain cock is mounted in the front end of the trap.

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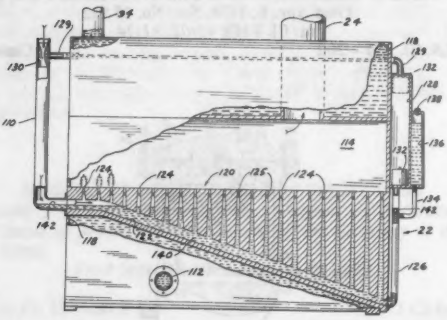
**3,599,661**
**SELF-MODULATING GAS BURNER**
**Walton W. Cushman, 36483 Gloucester Drive, Fraser, Mich.**
**Division of Ser. No. 714,649, Mar. 20, 1968, Pat. No. 3,514,034. Filed Feb. 5, 1970, Ser. No. 8,901**
**Int. Cl. F16k** *9/00*
**U.S. Cl. 137—252** **6 Claims**



An automatic, self-modulating, gas-fired, gas-powered, forced-circulation residential or other hot water heating system, which is fully and efficiently operable without electricity or any other form of externally supplied power, other than the natural or other gas used for combustion, and includes a zone temperature-responsive control system which likewise requires no electricity or other external source of power.

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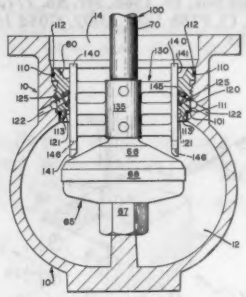
**3,599,662**
**HYDRANT DRAIN VALVE SEAL**
**James William Dashner, Elmira, N.Y., assignor to Kennedy Valve Mfg. Co., Inc., Elmira, N.Y.**
**Filed July 18, 1969, Ser. No. 842,923**
**Int. Cl. E03b** *9/14*
**U.S. Cl. 137—307** **2 Claims**

A sealing arrangement for the drain openings in a hydrant valve seat ring wherein the radial passages leading from these openings through the ring wall area slanted with respect to



the ring axis and have their inner ends enlarged to receive hollow resilient sleeves cut on the bias.

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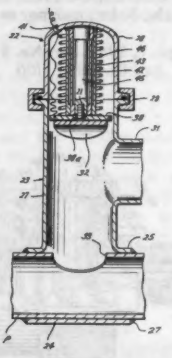
**3,599,663**
**HOT TAPPING APPARATUS**
**Burton Ver Nooy, Broken Arrow, Okla., assignor to T. D. Williamson Inc., Tulsa, Okla.**
**Filed Nov. 18, 1968, Ser. No. 776,353**
**Int. Cl. F16l** *41/04*
**U.S. Cl. 137—318** **22 Claims**



Apparatus comprising a housing adapted to be connected to a pipeline for surrounding in fluidtight relation an area of the pipeline to be tapped and having an opening therein adapted to be connected with the opening to be formed in the pipeline. Each of one or more shaped charges is carried by a holder for disposal over the periphery of the area to be removed, and a fuse connecting with each charge extends exteriorly of the housing to permit the charge to be detonated in response to a signal from a remote location in order to cut the coupon from such area. A means is disposed entirely within the housing to withdraw the holder and the coupon into a portion of the housing removed from the path between the opening in the housing and the opening cut in the pipeline.

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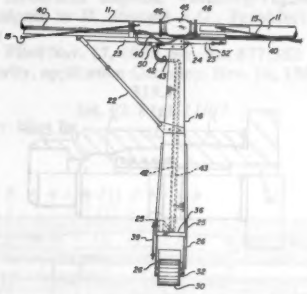
**3,599,664**
**SELF-PROPELLED IRRIGATING APPARATUS**
**Kenneth W. Hotchkiss, Golden; John F. Schrunk, Arvada, Colo., and Le Roy Thom, Hastings, Nebr., assignors to T-L Irrigation Company, Hastings, Nebr.**
**Filed Aug. 15, 1969, Ser. No. 850,425**
**Int. Cl. A01g** *25/02;* **F16n** *13/22*
**U.S. Cl. 137—344** **10 Claims**

Self-propelled irrigating apparatus comprising a water distributing pipe made of relatively rigid sections and flexible

joints between and connected to the sections, spaced apart supports supporting the distributing pipe, drive means for moving the supports in annular paths around a center, a hydraulic motor on each support, and hydraulic conduits extending along the outside of the distributing pipe for controlling the motors including a hydraulic valve and pressurized hydraulic fluid and return lines to and from each



motor through said valve. The system is controlled entirely by the hydraulic means and mechanism responsive to bending of the flexible joints, without any electrical wiring or switches. Each flexible joint is mounted on a pivotal platform on a support; the platform responds to bending of the flexible joint and actuates the spool of the hydraulic valve to control flow of hydraulic fluid to the motor.

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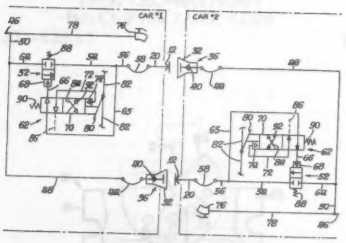
**3,599,665**

## AUTOMATIC AIR LINE CONNECTION SYSTEM

**Howard I. Dwyer, Jr., Glen Ellyn, Ill., assignor to Armsted Industries Incorporated, Chicago, Ill.**

**Filed Sept. 24, 1969, Ser. No. 860,658**
**Int. Cl. B61g 5/06; B60t 7/20**
**U.S. Cl. 137—349** **8 Claims**



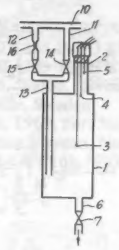
An automatic system for connecting and disconnecting the brake pipe air lines between two adjacent cars is disclosed. The system requires no manual operation other than that required for operating the automatic car coupler and comprises a plurality of probe members and probe receiving members being mounted at the coupler of each car to provide parallel flow paths for the brake pipe air between each car. Included in the system is control circuitry contained on each car for utilizing the parallel flow paths for feedback from one circuit to another to permit conventional operation of the air brake equipment while providing additional features such as automatic serial charging of the car brakes upon coupling, manual retention of air in brake pipe in either car at uncoupling and automatic reset of the control circuitry after an uncoupling operation to permit conventional use of air brake equipment.

**3,599,666**

## MEASURING DEVICE

**Peter Edward Curtis, and Peter Alfred Robert Wills, both of Ilford, England, assignors to Ilford Limited, Ilford, England**

**Filed Apr. 8, 1970, Ser. No. 26,505**
**Claims priority, application Great Britain, Apr. 8, 1969, 17827/69**
**Int. Cl. G05d 9/12**
**U.S. Cl. 137—391** **9 Claims**



This application describes a liquid metering vessel which comprises two upper liquid contact probes the lower of which controls a fast-filling valve and the upper of which controls a slow-filling valve. The vessel is filled with liquid through the fast-filling valve until the lower contact probe is reached. The fast-filling valve is then shut off and liquid enters the vessel through the slow-filling valve until the upper probe is reached. The upper probe is placed in an extension to the vessel which has a considerably smaller diameter than the rest of the vessel. The fast-filling valve is then shut off. By means of this vessel the amount of liquid fed into the vessel may be very strictly controlled.

Similar probes may be fitted in the lower part of the vessel to control the rate of outflow from the vessel.

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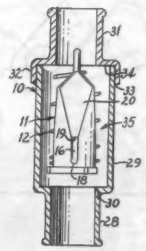
**3,599,667**

## VENTILATION CONTROL VALVE

**Arthur M. Kaser, Plainfield, N.J., assignor to Filter Dynamics International Inc., Edison, N.J.**

**Filed Feb. 18, 1969, Ser. No. 800,145**
**Int. Cl. F16k 17/04**
**U.S. Cl. 137—480** **5 Claims**

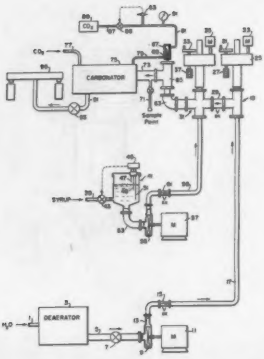


A valve houses a spring-biased poppet having tapered grooves accommodating airflow therethrough from an engine crankcase to the inlet manifold of the engine carburetor. The poppet responds to the vacuum created by engine turnover, thereby retracting the grooves when there is a high vacuum and projecting them when there is a low vacuum.

## 3,599,668
## LIQUID BLENDING APPARATUS

Roland P. Ricardi, Natick, Mass., assignor to Spectra Analyzer Corporation, Holliston, Mass.

Filed June 11, 1969, Ser. No. 832,302
Int. Cl. F04d 13/14
U.S. Cl. 137—567 13 Claims

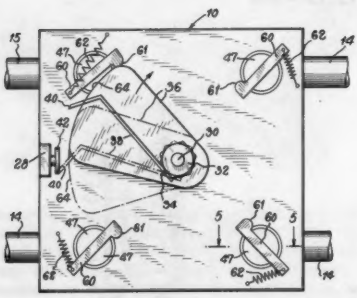


A liquid blender for mixing two fluid streams to form a stream of predetermined composition in which mixing is accomplished by feeding the streams at substantially constant pressure through a mixing valve in which flow control is achieved by uncovering a predetermined number of ports each representing a small portion of the total flow.

## 3,599,669
## AUTOMATIC LAWN SPRINKLER CONTROL

Allen F. Polzer, 108 Cadmus Ave., East Paterson, N.J.

Filed May 1, 1970, Ser. No. 33,651
Int. Cl. F16k 11/10
U.S. Cl. 137—608 5 Claims

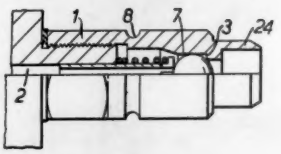


A control-valve mechanism which may be used to control the flow of liquids from one inlet to a number of outlets, which includes a plurality of valves operated by a cam. The cam is operated through an electric motor having a control circuit which includes a timer and a timer bypass switch, the bypass switch being operated by a trip arm which is connected to the cam.

## 3,599,670
## FLUID COUPLINGS

John Raymond Gurner, and Leslie Arthur Henman, both of Ilford, England, assignors to The Plessey Company Limited, Ilford, England

Filed Dec. 12, 1967, Ser. No. 689,898
Claims priority, application England, Dec. 14, 1966, 55947/66
Int. Cl. F16l 29/00, 37/28
U.S. Cl. 137—614 5 Claims

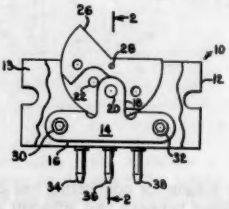


A fluid coupling comprises two separable parts, one of the parts including normally closed valve means which may be opened by valve actuating means carried on the other part when the two parts are coupled together, the actuating means being controllable remotely from the coupling. The valve means may be actuated remotely via a flexible hose connected to the part including the valve actuating means, and the same hose may be used for passing fluid through the coupling at a maximum rate determined by the design of the coupling. If the maximum rate is exceeded for example by leakage from the hose the coupling valve will close and prevent further flow.

## 3,599,671
## FLUIDIC SWITCH

Stanley Leszczynski, Schenevus, N.Y., assignor to The Bendix Corporation

Filed May 21, 1969, Ser. No. 826,519
Int. Cl. F16k 11/02
U.S. Cl. 137—625.21 3 Claims



A four-way switch of particular utility in fluidic computation and control apparatus is disclosed herein. The switch comprises a pivotable switching and control member having a flat surface resiliently biased toward a plane surface of the housing. The plane surface of the housing is perforated in three locations with the perforations being communicated to three mutually independent fluid outlets. The pivotal member includes, on the surface opposed to the flat surface, a detent receiving means for holding the member in either of

two pivotal positions and on the flat surface, a channel adapted to intercommunicate the center perforation with either of the other perforations. The pivotal member is further perforated by two passages arranged to communicate the third of the housing member perforations through the valve to the ambient to vent the unused passage system.

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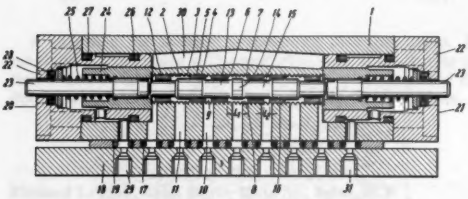
3,599,672
PISTON VALVE
Ludovicus Hendrikus Baghuis, Vliedberg/Vlijmen, Netherlands, assignor to D. Stempel A.G., Frankfurt am Main, Germany
Filed Nov. 17, 1969, Ser. No. 877,382
Claims priority, application Germany, Nov. 16, 1968, P 18 09 319.1
Int. Cl. F16k *11/07*
U.S. Cl. 137—625.48 5 Claims



This invention concerns a piston valve, preferably multipath valve, with a housing fitted with boreholes to add or withdraw a pressure fluid, and provided with a threaded bore therethrough into which at least two sleeves are threadedly received and cemented. The sleeves form guiding edges and pressure chambers, and are fitted with a sliding piston, axially slidable in the sleeve and having segments of different diameters.

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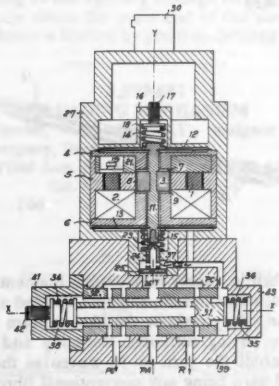
3,599,673
ELECTRIC PRESSURE-REDUCING VALVE
Rene Lucien, Neuilly-sur-seine, France, assignor to Societe Anonyme clite: Messier, Paris, France
Filed Jan. 15, 1969, Ser. No. 800,323
Claims priority, application France, Jan. 15, 1968, Dec. 23, 1968, 135,940;179,987
Int. Cl. F16k *11/07, 31/08*
U.S. Cl. 137—625.61 6 Claims



An electric pressure-reducing valve is provided for regulating a hydraulic utilization pressure by means of a low electric control current and comprises two stages, i.e., a primary stage constituted by a magnetic force motor and a stop-valve and jet-nozzle system, and a secondary stage constituted by a hydraulic slide valve servo-controlled by the pressure regulated in the primary stage. The primary stage is wholly constructed along a single axis of revolution: the power developed by the magnetic force motor is directed along this axis, the movement of the stop-valve is a movement of translation along this axis, the jet-nozzle is mounted on this axis; the primary stage is mounted on the body of the electric pressure-reducing valve so as to form an independent unit which is readily removable along said axis without any risk of upsetting the adjustments.

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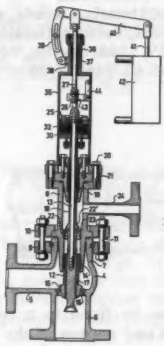
3,599,674
VALVE MEANS FOR CONVERTING SUPERHEATED HIGH PRESSURE STEAM INTO STEAM OF LOWER PRESSURE AND TEMPERATURE
Berth Ulrik Gustafsson, Saffle, Sweden, assignor to A.B. Kalle-Regulatorer, Saffle, Sweden
Filed Oct. 6, 1969, Ser. No. 864,004
Claims priority, application Sweden, Nov. 29, 1968, 16325/68
Int. Cl. F16k *19/00*
U.S. Cl. 137—630.22 8 Claims



Valve means comprising a steam valve and a water supply valve proportioning water to a steam conduit downstream of the steam valve, said water valve being adapted to close a little before the steam valve is closed.

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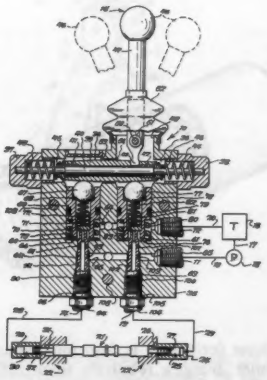
3,599,675
PROPORTIONAL VALVE
Donald A. Sievenpiper, Alden, N.Y., assignor to ATO Inc., Cleveland, Ohio
Filed Feb. 6, 1970, Ser. No. 9,201
Int. Cl. F16k *11/10*
U.S. Cl. 137—636.1 18 Claims



A control valve adapted to be connected in an hydraulic circuit including two cylinders movable against correspond-

ing linear springs and connected to opposite ends of a mechanical load, such as the spool of a master valve in a relatively high-pressure circuit. Fluid from either of two chambers in the control valve connected to corresponding ones of the hydraulic cylinders is bled to a tank or reservoir in proportion to the movement of a control valve handle. The resulting pressure unbalance creates proportionate movement of the mechanical load. Flow controlling means in the form of a first poppet member and a second poppet carried in the first poppet and axially movable therein are in each of the valve chambers and moved from a seated to an unseated position allowing bleedoff of fluid. The poppets are spring-biased and operatively connected through a ball or roller-type follower to a tapered, elongated cam member axially movable and operatively connected to the valve handle. Two additional chambers and corresponding flow controlling means can be included and to which are transmitted additional movements of the valve handle whereby a single hydraulically movable load can be controlled in a plurality of directions or two loads controlled separately or interdependently.

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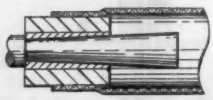
**3,599,676**

**FIREHOSE**

**John C. Fisher, Toronto, Ontario, Canada, assignor to George Angus (Canada) Limited, Toronto, Ontario, Canada**

**Filed July 19, 1968, Ser. No. 746,021**
**Int. Cl. F16l** *57/00*
**U.S. Cl. 138—109** **13 Claims**



To enable a hose to be fitted to a coupling of smaller diameter, the terminal end portion of the hose is supported internally and pressure is applied circumferentially around the terminal end portion.

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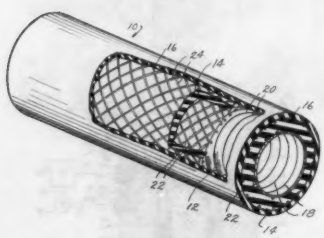
**3,599,677**

**FLEXIBLE TUBING AND THE MANUFACTURE THEREOF**

**Patrick W. O'Brien, Springhead, near Oldham, England, assignor to Compoflex Company Limited, Lumb Hill, Delph, near Oldham, Lancashire, England**

**Filed July 24, 1967, Ser. No. 655,303**
**Claims priority, application Great Britain, Sept. 28, 1966, 43,397/66**
**Int. Cl. F16l** *11/04, 11/08*
**U.S. Cl. 138—122** **22 Claims**




A flexible hose for tubing is described which has a seamless plastic inner lining, a relatively thick rubber cover extruded about the outside of the inner lining and a relatively thin outer rubber cover surrounding the thick cover. The wall of the inner lining has inner and outer annular corrugations each of which extend around the lining and is parallel to the other corrugations. A layer of reinforcing filaments is spirally wound about the outside of the inner lining, and these filaments become partially embedded in the thick rubber cover when the latter is extruded over the inner lining. A second layer or spirally wound reinforcing filament may be placed between the thick cover and the thinner outer cover.

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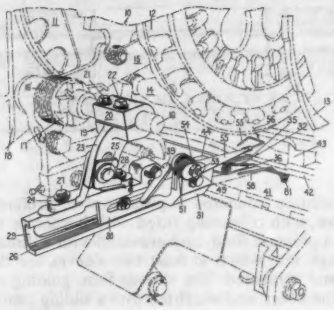
**3,599,678**

**THREAD PARTING, CLAMPING AND DETECTING MECHANISM**

**William E. Turner, Spartanburg, S.C., and Albert R. Ferrier, Woonsocket, R.I., assignors to North American Rockwell Corporation, Pittsburgh, Pa.**

**Filed Mar. 19, 1969, Ser. No. 808,464**
**Int. Cl. D03d** *51/38*
**U.S. Cl. 139—336.4** **5 Claims**



A filling yarn parting and clamping mechanism for automatic filling replenishing looms including means for sensing the presence of yarn held by said mechanism and for automatically stopping the loom upon indication of yarn absence.

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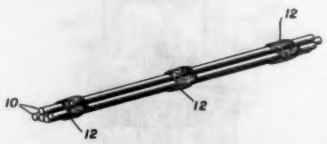
**3,599,679**

**INEXTENSIBLE FILAMENTARY STRUCTURE AND FABRICS WOVEN THEREFROM**

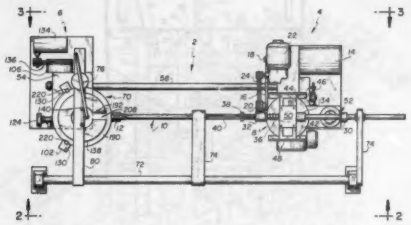
**Ernest P. Carter, Durham, N.C., assignor to Monsanto Company, Saint Louis, Mo.**

**Filed Oct. 22, 1968, Ser. No. 769,678**
**Int. Cl. D03d** *15/00;* **D02g** *3/12, 3/36*
**U.S. Cl. 139—420** **5 Claims**



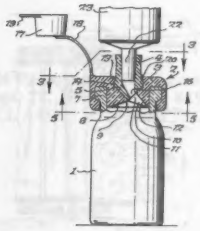

Strands of brittle, highly inextensible filamentary material are collimated into a bundle and spot bonded at regular intervals with an epoxy resin or the like, to form a composite yarn structure having sufficient flexibility and mechanical stability to permit the yarn to be woven as the warp of a fabric, the fill yarn being any conventional fibrous material. The inextensible filamentary materials include, among others, boron, boron carbide, silicon, silicon carbide, carbon, quartz, and similar inorganic refractory fibers which are characterized by high strength and modulus, brittleness, and inextensibility.

3,599,680
## MACHINE FOR MAKING WIRE-WOUND DISC ARMATURES
Robert Page Burr, Huntington, N.Y., assignor to Photo-Circuits Corporation, Glen Cove, N.Y.
Filed Apr. 8, 1969, Ser. No. 814,421
Int. Cl. B21f 3/00
U.S. Cl. 140—92.2 31 Claims



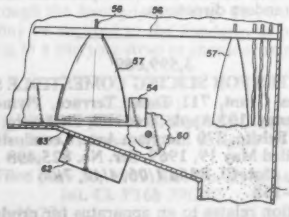
A machine for making wire-wound disc armatures. The machine is comprised of a spindle section and a turret section which operate in synchronization to wind insulated conductor wire into an armature for use in electric machines.

3,599,681
## CONTAINER CLOSURE
Richard L. Hall, 8217 North Main St., Eden, N.Y.
Filed Feb. 2, 1970, Ser. No. 7,726
Int. Cl. B65b 1/04, 3/04
U.S. Cl. 141—18 7 Claims



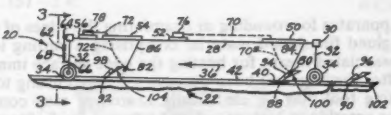
A two-part closure assembly having a sleeve part rotatable in a stopper part between open and closed positions. The two parts have mating conical sealing surfaces each with an opening therethrough, the openings being in registry in the open position. The sleeve part snugly receives the needle fitting of a hypodermic syringe and the stopper part has a dished under surface leading to the opening through its sealing surface. A removable cap closes the outer end of the sleeve, and rotation of the sleeve is limited by position-defining stop means.

3,599,682
## LOADING MECHANISM
Conrad Altmann, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.
Filed Aug. 30, 1968, Ser. No. 756,607
Int. Cl. B65b 1/04, 3/04
U.S. Cl. 141—106 4 Claims



A bag nest for use in an electrographic machine receives a bag, carrying toner. While vertical movement of the bag is restricted, it is ruptured by a saw or knives, thereby emptying the toner into a dispensing mechanism below the bag. The bag is removed from the nest so that another bag may be inserted. In preferred embodiments, toner reluctant to leave the bag is dislodged as the bag is dragged over a rigid edge of the nest while being removed for disposal. Mechanisms, such as barbed spears, rails and jaw gripping devices are disclosed for performing at least part of the holding and/or bag disposing functions.

3,599,683
## APPARATUS FOR GUIDING RELATIVELY MOVABLE INTERCONNECTABLE FITTINGS INTO AND OUT OF CONNECTED RELATION
Carl V. Von Linsowe, 2820 Julio Ave., San Jose, Calif.
Filed Sept. 19, 1969, Ser. No. 859,506
Int. Cl. B65b 1/04, 3/04
U.S. Cl. 141—232 7 Claims



An irrigation system including a stationary water supply having a plurality of outlet couplings and a mobile irrigator adapted to travel adjacent and relative to the water supply, and to receive water therefrom, having a pair of movable inlet couplings. The inlet couplings are releasably interconnectable with the outlet couplings. Apparatus is provided in the system both for guiding an inlet coupling toward a position for enabling interconnection thereof with an outlet coupling, and for guiding an inlet coupling away from an outlet coupling after disconnection therebetween while the irrigator travels relative to the supply.

3,599,684
## CONTAINER-DISPENSER UNIT
Albert J. Elias, Oakley Lane, Greenwich, Conn., assignor to Schering Corporation, Bloomfield, N.J.
Filed Sept. 26, 1969, Ser. No. 861,387
Int. Cl. B65b 1/04, 3/04
U.S. Cl. 141—369 2 Claims

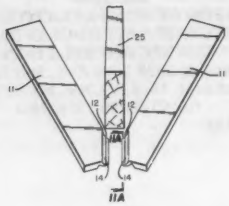
A combined container-dispenser package for liquids, especially liquid concentrates, characterized by the storage container having recessed in its sidewall a vertically extending concavity adapted to nest a receptacle, and pump means mounted atop the container capable of metering a predetermined amount of the liquid into the so-nested receptacle.

3,599,685

## UNIT AND METHOD FOR WOODWORKING

Henry Westergren, and Bertil Larsson, both of Kallhall, Sweden, assignors to Karlholms Aktiebolag, Stockholm, Sweden

Filed Dec. 18, 1967, Ser. No. 691,389
Claims priority, application Sweden, Oct. 23, 1967, 14474/67
Int. Cl. B27c 9/00
U.S. Cl. 144—38 2 Claims



Apparatus for rounding or chamfering the edges of a multiply glued fiberboard material comprising a cutting tool and an associated means for heating the edge surface immediately after the edge has been processed by the cutting tool. The heating tool may be electrically heated or may comprise a roller rotating at high speed and adapted for frictional heating of the edge surface.

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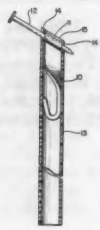
3,599,686

## HOLDING MEANS FOR PICTURE SUPPORTS

David Meade Peebles, 325 Marcy Ave., Oxon Hill, Md.

Continuation-in-part of application Ser. No. 711,335, Mar. 7, 1968, now abandoned. This application Sept. 17, 1969, Ser. No. 858,611
Int. Cl. A47h 1/16
U.S. Cl. 145—46 2 Claims



A picture supporting hook or nail is equipped with a temporary holder which enables the user to position the hook or nail on the wall at a safe distance from the fingers while hammering. The temporary holder also prevents separation of the hook and nail accidentally prior to hammering and greatly facilitates the handling of these small parts. After hammering, the holder is stripped away and discarded.

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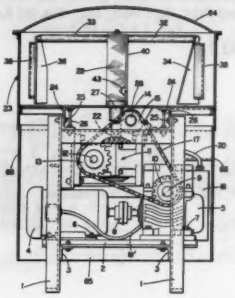
3,599,687

## AUTOMATIC MEAT MIXER AND GRINDER

William H. Tschantz, Kensington, Ohio, assignor to The Biro Manufacturing Company, Marblehead, Ohio

Filed Nov. 26, 1969, Ser. No. 880,048
U.S. Cl. 146—79 18 Claims

An automatic meat mixer and grinder including a tub into which chunks of fresh meat, suet or fat, chipped frozen meat and condiments or the like may be fed. Mixing blades or paddles in the tub include two inwardly disposed angular paddles of different lengths and at different angles, upon diametrically opposite ends of radial arms upon a central rotary shaft, and two offset oppositely disposed paddles or blades of different lengths upon said shaft. A feed screw at the bottom of the tub conveys the mixed meat to a conventional food



chopper including a perforate plate and rotary blade for grinding the mixed meat as desired.

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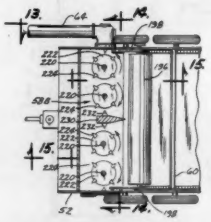
3,599,688

## LIVESTOCK FEED PROCESSING APPARATUS

John N. Dodgen, and Paul C. Swigger, both of Humboldt, Iowa, assignors to Dodgen Industries, Inc., Humboldt, Iowa

Filed June 3, 1969, Ser. No. 830,074
Int. Cl. B02c 18/06
U.S. Cl. 146—124 2 Claims



Apparatus for processing animal feed involving a chopper unit in a wagon being fed hay by a conveyor wherein the hay is under compression from a powered roller coordinated in its speed with the speed of the chopper unit. The chopper unit involves one or more rotatable units having blades around its periphery which cooperate with stationary blades in cutting the feed material. One or more pairs of chopper rollers may be provided which turn towards the chopper unit inlet and cooperate with adjacent stationary blades. The material from the wagon may be fed from the chopper unit directly into an apparatus for producing livestock feed pellets having a hammer mill or the like. The chopper unit may also be placed on the machine for producing the pellets. The ground feed prior to being pelletized may be screened by a baffle plate having magnets associated with it for extracting metallic foreign material in the feed. The pellets produced by the pelletizer unit may be sorted by eccentrically operated shaker to separate out the fines. The forward lower end of the shaker being pivotally connected to the frame while the rear raised end is connected to the powered eccentric and may move in random directions.

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3,599,689

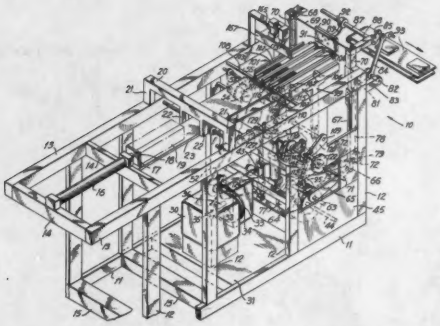
## APPARATUS FOR SLICING COMESTIBLE SLABS

Charles James Grant, 711 Torke Terrace, Plymouth, Wis.; Paul E. Cheney, 103 Apple Tree Hill, Fitchburg, Mass., and Kenneth J. Belsito, 370 Merriam Ave., Leominster, Mass.

Filed May 19, 1969, Ser. No. 825,498
Int. Cl. B26d 1/06, 4/42, 7/06
U.S. Cl. 146—158 3 Claims

This invention relates to an apparatus for producing equal numbers of slices from uniform cross section slabs, each of

which varies in length within a predetermined range comprising means for continuously slicing said slab, means for positioning the leading edge of each slab in alignment with the path of movement of said slicing means, means for displacing said slab predetermined distances beneath said slicing means to define the slice thicknesses, recording means for controlling said displacement means whereby the distances are programmed from known slab lengths, sensing means which measure said slab length within subdivisions of said range, said sensing means and said recording means being operatively associated whereby signals from said sensing means indicate the program for said slab.



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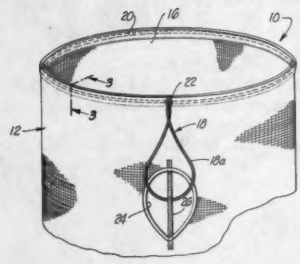
**3,599,690**
**CARRYING BAG**
**James Christie, 5656 Cedarglen Drive, Azusa, Calif.**
**Filed Sept. 22, 1969, Ser. No. 859,820**
**Int. Cl. A45c** *13/26;* **B65d** *33/28*
**U.S. Cl. 150—11** **4 Claims**



A general purpose carrying bag having a tubular body with open and closed ends and a sidewall opening containing a handgrip secured to the bag wall at opposite sides of the opening for holding and carrying the bag. A drawstring laced about the mouth of the bag has a free end which may be pulled to close the mouth and then stored within the bag by insertion through the handgrip opening. The free end of the drawstring may be secured to the handgrip to permit use of the drawstring as a carrying strap or shoulder strap.

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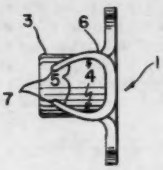
**3,599,691**
**FLANGED NUT WITH ATTACHING PRONGS**
**Norman J. Hughes, Melrose, Mass., assignor to TRW Inc.,, Cleveland, Ohio**
**Filed June 30, 1969, Ser. No. 837,504**
**Int. Cl. F16b** *39/282*
**U.S. Cl. 151—41.73** **2 Claims**

A flanged nut having attaching prongs disposed in cooperating pairs, the prongs of each pair are disposed in face-to-face relationship and are curled inwardly toward each other and the threaded shank of the nut.



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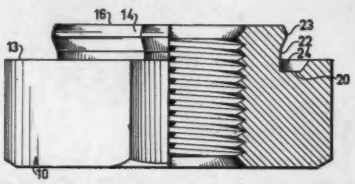
**3,599,692**
**LOCK NUT ASSEMBLY AND METHOD OF MAKING THE SAME**
**Horace D. Holmes, Birmingham, Mich., Assignor to Masco Corporation, Taylor, Mich.**
**Filed June 12, 1969, Ser. No. 832,611**
**Int. Cl. F16b** *39/02*
**U.S. Cl. 151—2 R** **6 Claims**



A lock nut assembly and method of making the same in which a non-circular bolt shank or other fastener body is provided with rolled threads of uniform depth around its entire circumference and a standard nut having a circular threaded aperture is threaded onto the bolt and then deformed radially inwardly to effect complete engagement of the threads of the nut with the threads of the bolt around the entire circumference of the bolt. The nut may be removed from the bolt with the use of a power tool and then reapplied to the bolt in the same manner.

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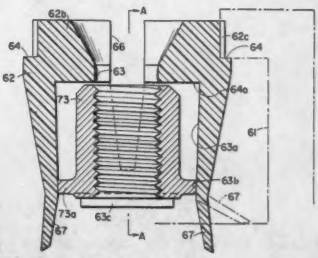
**3,599,693**
**ANCHORING DEVICE FOR SECURING OBJECTS TO A C-CROSS SECTION BAR**
**Josef Bucheli, Herrliberg, Switzerland, assignor to Tuflex A.G., Glattbrugg, Switzerland**
**Filed June 23, 1969, Ser. No. 835,389**
**Claims priority, application Switzerland, Apr. 30, 1969, 6681/69**
**Int. Cl. F16b** *39/28*
**U.S. Cl. 151—41.75** **6 Claims**



An anchoring device, for the disengageable securing of objects to a channel shape bar having inturned lips on its flanges defining a slot, comprises a plastic shell having a rectangular cross section and a central bolt-receiving bore.

The shell has a neck portion with two opposite edges offset inwardly to an interspacing substantially equal to the width of the bar slot. At least one slot extends parallel to the offset edges into the neck portion to provide compressibility of the nut for pressing of the shell into the bar with the offset edges parallel to the edges of the bar slot. The offset edges form respective shoulders engageable beneath the lips of the bar. The bore may receive an internally fitted sleeve to be anchored in the shell.

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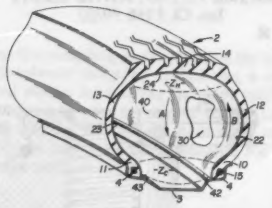
**3,599,694**
**LIQUID COOLED PNEUMATIC TIRE**
**William Bezbatchenko, Jr., 323 Orville Ave., Cuyahoga Falls, Ohio, and Kenneth P. Kinas, Lakeview Drive, Greenlake, Wis.**
**Filed Oct. 15, 1969, Ser. No. 866,708**
**Int. Cl. B60c** *19/06*
**U.S. Cl. 152—153** **21 Claims**



A pnuematic tire is provided with an internal cooling means comprising as a preferred embodiment a sheet of capillary material disposed across the inner surface of the tire from bead to bead. The sheet possesses capillarity for a selected liquid in order to transport that liquid from the bead areas to the tread zone where excess heat, which can develop in that zone during use, is absorbed through vaporization of the liquid. The vapor formed will thereafter condense adjacent the beads and release heat to the cooler rim and bead zone. The liquid resulting from the condensation is absorbed by the sheet and once again transported to the tread zone, thereby providing an effective and substantially continuous heat exchange cycle between the overheated tread zone and the cooler rim and bead area.

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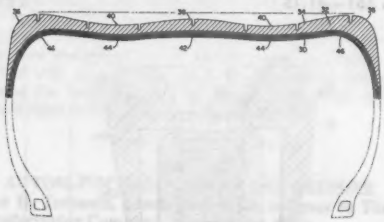
**3,599,695**
**PNEUMATIC TIRE**
**Donald L. Knight, Kent, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio**
**Filed May 27, 1968, Ser. No. 732,206**
**Int. Cl. B60c** *3/00*
**U.S. Cl. 152—352** **10 Claims**



A pneumatic tire having a carcass and a tread disposed about the carcass wherein the ground contact surface of the tread, when the tire is viewed in cross section, is generally sinuous in configuration to provide at the tread centerline a convex portion bounded at its opposite sides by a pair of reversely curved concave portions each of which is disposed between the tread centerline and the shoulder areas of the tire or lateral edges of the tread. The carcass underlying the tread has a cross-sectional contour in the crown area of the tire which generally approximates the sinuous configuration of the ground contacting surface of the tread. The tread may be thicker at the centerline than it is generally at the center of the two portions of the tread underlying the concave portions of the ground contacting surface of the tread.

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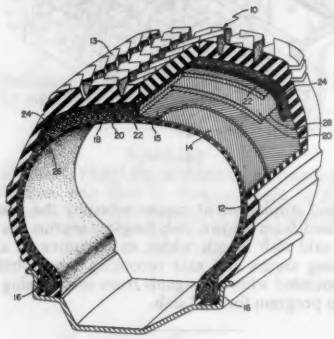
**3,599,696**
**PNEUMATIC TIRE**
**John J. Hartz, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio**
**Filed Feb. 7, 1969, Ser. No. 797,475**
**Int. Cl. B60c** *9/12*
**U.S. Cl. 152—361** **28 Claims**



A bias-belted pneumatic tire, in particular one with a polyester cord carcass and a fiberglass belt, in which there is provided over the belt a layer of randomly oriented, discrete filaments, preferably wire, which are embedded in low hysteresis rubber. The filamentary layer is superposed at least substantially directly over the belt and is at least as wide as the belt.

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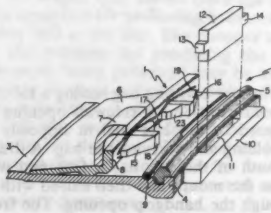
**3,599,697**
**WHEEL RIM AND DRIVER LUG ASSEMBLY THEREFOR**
**Gerhart L. Gerbeth, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio**
**Filed Aug. 21, 1969, Ser. No. 851,942**
**Int. Cl. B60c** *5/16*
**U.S. Cl. 152—410** **12 Claims**

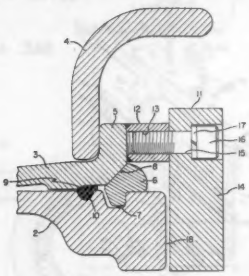


A multipiece wheel rim having a special driver lug assembly, having a pair of circumferentially spaced-apart lugs mounted on a bead seat ring to engage a member attached to the rim base of a wheel rim and prevent circumferential movement of the bead seat band on the rim base when the rim is used on a vehicle. The driver lugs are so designed and positioned that they permit substantially uniform radial flexing of the bead seat band thereby preventing undesirable stresses at any given location on the bead seat band.

## 3,599,698
## RIM

Michael J. Skehan, Fairlawn Village; Gerhart L. Gerbeth, Akron; Gilbert J. Bozzelli, Cuyahoga Falls, and Paul E. Milliken, Masillon, all of, Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Sept. 8, 1969, Ser. No. 855,997
Int. Cl. B60c 5/16
U.S. Cl. 152—410 9 Claims



A multipiece rim for use on off-the-road type vehicles such as earthmovers and the like, particularly those vehicles using low-pressure tires. A thrust plate is bolted to a bracket on the bead seat band of the rim and extends over the axially outer edge of the rim base to prevent axially inward movement of the bead seat band which may break the seal between the bead seat band and the rim base and permit loss of air from a tire carried on the rim. In addition to engaging the rim base to prevent axial movement, the thrust plate may also engage one or more lugs on the rim base to prevent circumferential movement of the bead seat band with respect to the rim base.

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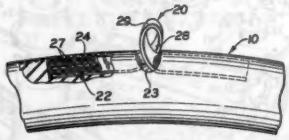
## 3,599,699
## VERTICALLY SUSPENDABLE MOUNT TUBE

Irvin E. Middleton, Jr., Akron, Ohio, assignor to The General Tire & Rubber Company

Filed Apr. 29, 1970, Ser. No. 32,798
Int. Cl. B60c 25/12
U.S. Cl. 157—1.21 10 Claims

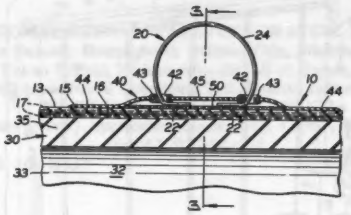


The difficult tasks of spreading the bead portions of pneumatic tire casings to mount the casings on rims, insert inner tubes, etc. are facilitated through use of a ringlike inflatable elastomeric diaphragm adapted to forcibly engage the periphery of the tire. Such a diaphragm is more conveniently operated while positioned along a vertical axis. For additional convenience and efficiency, it is desirable to suspend such diaphragm from overhead, for easy movement downwardly to an operating position, and upwardly to a storage position. In order to structurally adapt these diaphragms for vertical suspension, support means are built into or made a structural part of the diaphragm. The support means are preferably a plurality of spaced support loops disposed about the periphery of the diaphragm and anchored within the outer wall thereof.

## 3,599,700
## SUSPENDABLE MOUNT TUBE

Adolfo O. Cutillo, Brecksville; Joe A. Gourley, Jr., Akron, and Ray A. Orlando, Alliance, all of, Ohio, assignors to The General Tire & Rubber Company

Filed June 8, 1970, Ser. No. 44,504
Int. Cl. B60c 25/12
U.S. Cl. 157—1.21 12 Claims



An inflatable, ringlike, elastomeric diaphragm, or mount tube, used to spread pneumatic tire casings to facilitate mounting of the casing on rims, or to otherwise gain access to the interior of the casing, is provided with means for securing support loops or rings to the tube in the event the tube is to be handled and used while suspended. Such means are preferably a plurality of elastomeric pads cured to the exterior of the tube in the vicinity of the upper side or marginal portion thereof. The strips are each provided with a pair of openings through which a support or suspensory loop or ring may be passed. A suitable substance is placed between the exterior of the tube and a portion of the inner surface of the pad which includes the openings to prevent curing of that portion to the tube so as to allow passage of a support or suspensory loop therethrough.

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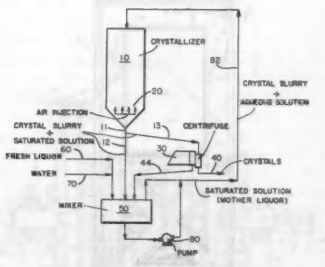
## 3,599,701
## CRYSTALLIZATION METHOD

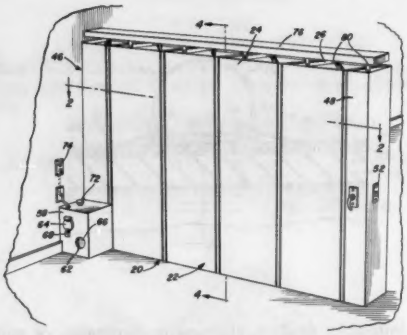
Bengt Olof Pontus Mollerstedt, and Karl Gunnar Stig Johansson, both of Ljungaverk, Sweden, assignors to Kema Nord AB, Stockholm, Sweden

Filed July 30, 1968, Ser. No. 748,755
Int. Cl. B01d 1/100; F26b 7/100
U.S. Cl. 159—47 10 Claims



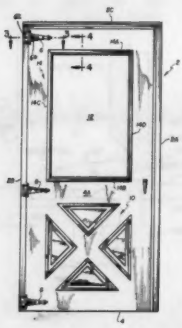

This invention generally relates to a method for continuous crystallization of water soluble compounds by means of which rounded or spherical crystals are obtained and good regulation of the size and the size distribution of the crystals is achieved. The method is particularly suitable for crystallization from aqueous solutions substantially free from impurities.

3,599,702
PNEUMATICALLY OPERATED COLLAPSIBLE UNIT
Norman M. Bedard, 5830 Red Road, Miami, Fla.
Filed July 10, 1969, Ser. No. 840,726
Int. Cl. E06b 3/94
U.S. Cl. 160—84 10 Claims



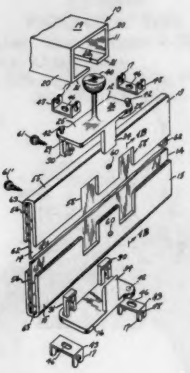
A collapsible unit selectively extensible so as to define an enlarged structural component usable as a door, cover, bridge, or the like. The unit is constructed of a series of adjacent cells communicating with each other and defining an airtight interior for the full length of the unit. The cells or sections are selectively expanded and collapsed utilizing the introduction and withdrawal of an appropriate fluid under pressure, such fluid normally being air. Any number of cells can be incorporated into the unit, and the overall length of any particular unit easily modified as required by the addition or removal of cells.

3,599,703
INSULATED STORM DOOR ASSEMBLY
Anthony R. Mennuto, 769 Pascack Road, Paramus, N.J., and Nicholas Popovich, Teaneck, N.J.
Filed Mar. 17, 1969, Ser. No. 807,859
Int. Cl. E06b 3/32
U.S. Cl. 160—90 3 Claims



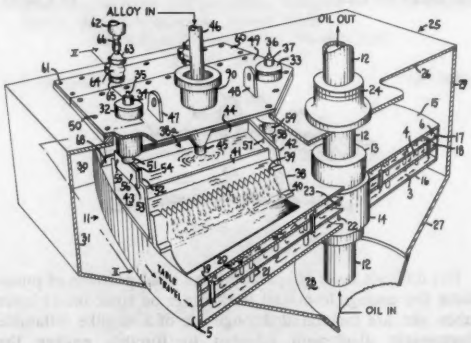
A storm door assembly mounted to an installation structure and including an insulating core sandwiched between a pair of one-piece panels. An opening in the upper portion of the door assembly accepts a frame. The frame is adapted for receiving screen and glass inserts, and which inserts are adapted for retaining a decorative grill.

3,599,704
VERTICAL VENETIAN BLIND CONSTRUCTION
Allan S. Woodle, Mamaroneck, N.Y., assignor to Thru-Vu Vertical Blind Corporation, Mamaroneck, N.Y.
Filed Oct. 2, 1969, Ser. No. 863,187
Int. Cl. E06b 9/384
U.S. Cl. 160—172 4 Claims



An improved vertical blind construction including: a plurality of vanes, clamp elements detachably connected to the unhemmed ends of the vanes; horizontally oriented supporting track means, a plurality of clip elements detachably connected to said clamp elements, said clip elements having upwardly extending means engaging said track means.

3,599,705
METHOD OF CONTINUOUSLY CASTING A UNIFORM METAL FILM
Harmon A. McDougal, and Erwin C. Whitney, both of Beaumont, Tex., assignors to PPG Industries, Inc., Pittsburgh, Pa.
Filed Dec. 9, 1969, Ser. No. 883,444
Int. Cl. B22d 11/06, 11/10
U.S. Cl. 164—87 2 Claims




A weir assembly suitable for use in conjunction with a rotary table is described for use in producing flakes of solid material from solutions or from molten metal baths. In particular the novel weir assembly of the instant invention is described with reference to the preparation of sodium-lead alloys. The assembly of the invention includes a tank, baffled to provide for the smoothing out of waves which might form during the filling of the tank with molten alloy. The weir plate is provided with a notched top portion to provide a uniform sheet of molten material flowing down the face

thereof. The molten metal is contacted with the cooling table surface off the surface of a spreading means positioned at the bottom of the plate.

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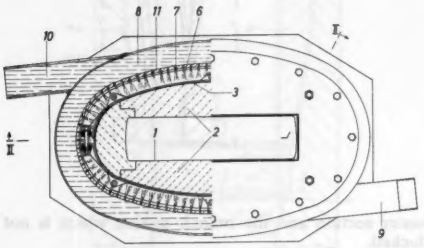
**3,599,706**

## CONTINUOUS CASTING MOLD WITH COATED JACKET UNDER SPRING TENSIONING

**Hans Wieland, Ulm, Germany, assignor to Wieland-Werke AG, Ulm, Germany**

**Filed Apr. 4, 1969, Ser. No. 813,582**
**Claims priority, application Germany, Apr., 1968, P 17 58 157.6**
**Int. Cl. B22d** *11/02*
**U.S. Cl. 164—280** **8 Claims**




A mold for continuous casting of metal has a graphite body which surrounds an elongated mold cavity. A metallic jacket surrounds the graphite body in engagement with the circumferential outer surface thereof, and the jacket is subdivided circumferentially of the surface into at least two jacket sections. Pressure means is associated with the jacket sections and draws the same together circumferentially of the graphite body to thereby urge the jacket into intimate surface-to-surface contact with the circumferential surface of the graphite body and subject the latter to radially inwardly directed pressure over the entire area of the circumferential surface.

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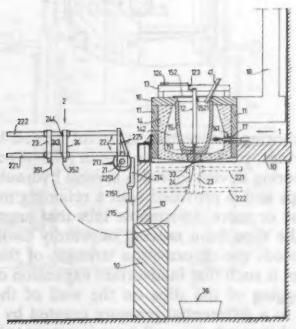
**3,599,707**

## MACHINE FOR CHILL-CASTING UNDER HYDROSTATIC PRESSURE

**Rene Lauzier, and Jean Gabillon, both of Ruy, France, assignors to Compagnie Pechiney, Paris and Etablissements Lauzier, Bourgoin, France, part interest to each**

**Filed May 4, 1970, Ser. No. 34,018**
**Claims priority, application France, May 6, 1969, 6,914,447**
**Int. Cl. B22d** *33/02, 37/00*
**U.S. Cl. 164—337** **4 Claims**



A machine for chill casting under hydrostatic pressure which includes a holding furnace mounted on a supporting frame including a crucible having a pouring opening in the bottom wall and a stopper mounted for movement between opening and closing positions with respect to said opening, a casting mold formed of at least two parts mounted on a rigid frame and a mold-pouring device in which the latter is formed of female and male injection nozzles one of which is mounted on the pouring jet and the other of which is fixed to the pouring hole of the furnace crucible with means for displacement of the mold to engage the male and female nozzle members.

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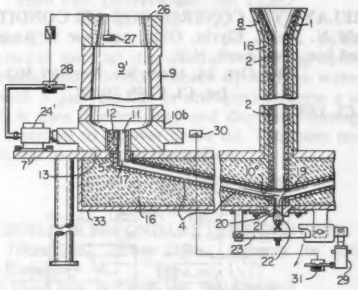
**3,599,708**

## BOTTOM POURING APPARATUS FOR STEEL INGOTS

**Kazuro Suzuki, Ibargagi-shi; Mitsuo Oda, Nishinomiya-shi, and Takao Suzuki, Nishinomiya-shi, all of, Japan, assignors to Sumitomo Metal Industries, Ltd., Osaka, Japan**

**Filed July 31, 1968, Ser. No. 749,173**
**Claims priority, application Japan, Aug. 4, 1967, 42/50025**
**Int. Cl. B22d** *41/08*
**U.S. Cl. 164—337** **7 Claims**




Making ingots in steel production, wherein casting molds filled with molten metal are moved on a board the surface of which blocks molten metal for steel ingots, but permits the flow of the metal, said molten metal runner routes being reusable.

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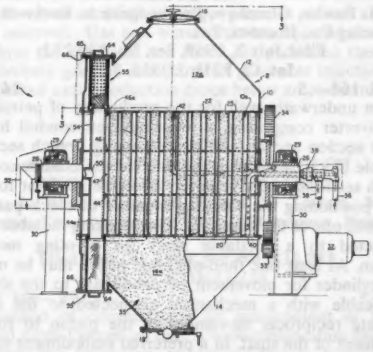
**3,599,709**

## HEAT EXCHANGE MILL

**John J. Fischer, East Stroudsburg, Pa., assignor to The Patterson-Kelley Co., Inc., East Stroudsburg, Pa.**

**Filed Apr. 2, 1970, Ser. No. 25,098**
**Int. Cl. F28d** *11/00*; **F28f** *5/00*
**U.S. Cl. 165—86** **9 Claims**



In a heat exchange and blending device for heat exchange treatment of flowable materials, comprising a tumbling mill

including a normally closed casing having a pair of tube sheets disposed in parallel relation transversely of the said casing and subdividing the casing into a generally cylindrical tube section and generally conical mixing chamber end sections at opposite ends thereof; generally parallel tubes extending endwise between the tube sheets in open communication with the end sections; means to pass heat exchange fluid through the tube section for contact with the outer surfaces of tubes therein; and means mounting the casing for rotation of the tube and end sections in unison about an axis transverse to the lengthwise direction of the tubes to effect movement of a load of material alternately from one end section through the tubes into the other end section, the improvement including the provision of at least one apertured baffle plate arranged parallel to the tube sheets and cooperating therewith to divide the casing tube section into heat exchange fluid inlet and outlet reservoirs interconnected solely by a plurality of orifices defined by the baffle plate apertures and the outer surfaces of the tubes extending therethrough. Vapor pressure control within the mixing chambers is effected by a system including filtering units accessible from exteriorly of the mixing chambers.

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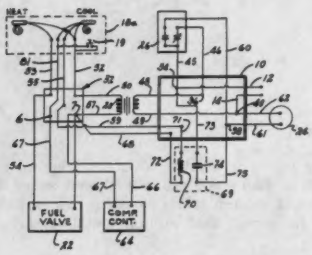
**3,599,710**

## RELAY-TYPE CONTROL FOR AIR CONDITIONER

**Donald N. Joslin, Elyria, Ohio, assignor to American Standard Inc., New York, N.Y.**

**Filed Oct. 24, 1969, Ser. No. 869,302**
**Int. Cl. F25b** *29/00*
**U.S. Cl. 165—26** **8 Claims**




An electric plugboard-relay assembly for converting a heating furnace into a combination heating and cooling air conditioner. The plug board is associated with a junction box in the furnace. The relay is provided with prong-type leads which plug into the board to enable the furnace to electrically connect with the compressor of a refrigerating system, thereby adapting the furnace for both heating and cooling.

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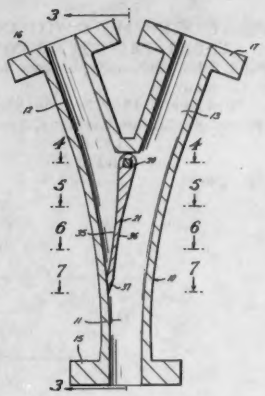
**3,599,711**

## DIVERTER

**John H. Fowler, Glenshaw, Pa., assignor to Rockwell Manufacturing Co., Houston, Tex.**

**Filed July 7, 1969, Ser. No. 839,253**
**Int. Cl. F21b** *33/035, 33/02*
**U.S. Cl. 166—.5** **24 Claims**

In an underwater well for the production of petroleum, a tool diverter comprising: a wye-branched conduit having a master section and at least two diverging branch sections, a movable blocking member mounted at the confluence of the branch sections, and a remotely operable actuator for selectively positioning the blocking member to block passage of tools into one of the branches. The blocking member may be connected to a rotatable shaft for pivoting movement thereon. At least one fluid-operated piston may be mounted in a cylinder for movement perpendicular to the shaft and engageable with a mechanism connected to the shaft to translate reciprocal movement of the piston to rotational movement of the shaft. In a preferred embodiment of the invention the branch sections of the wye conduit may be symmetrical with respect to the master sections. The blocking member may be a depending flapper the free end of which is movable from one wall of the master section to an opposite wall, each face of the flapper being symmetrically curved to provide a substantially continuous curving wall between the



master section and the branch section which is not being blocked.

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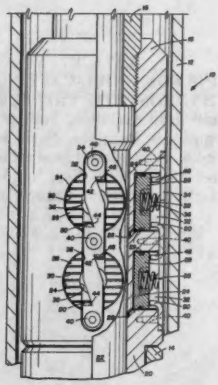
**3,599,712**

## HYDRAULIC ANCHOR DEVICE

**Charles W. Magill, Dallas, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.**

**Filed Sept. 30, 1969, Ser. No. 862,199**
**Int. Cl. E21b** *23/04*
**U.S. Cl. 166—212** **5 Claims**



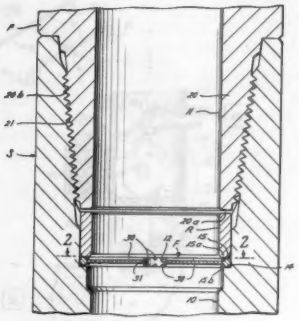
An anchoring device that is useful in well bores to retain tubing strings, packers or the like in a fixed position therein. The anchoring device includes several hydraulically actuated piston slips and is provided with a retaining member that includes one or more deformable tabs that engage the slips to prevent the slips from moving outwardly until the hydraulic force exceeds the deformation strength of the tabs. The arrangement is such that inadvertent expansion of the slips and, thus, dragging of the slips on the wall of the well bore in response to a differential pressure created by the movement of the tool through the well bore is prevented. The slips are positively restrained until a pressure sufficient to deform the tabs is deliberately applied whereupon the slips are moved into holding engagement.

3,599,713

## METHOD AND APPARATUS FOR CONTROLLING THE FILLING OF DRILL PIPE OR THE LIKE WITH MUD DURING LOWERING THEREOF

Thomas D. Jenkins, Harvey, La., assignor to Fishing Tools, Inc

Filed Sept. 8, 1969, Ser. No. 856,116
Int. Cl. E21b 41/00
U.S. Cl. 166—224 6 Claims



A method and apparatus for controlling the filling of drill pipe or the like with mud or other liquid during the lowering thereof into a pipe or casing having the mud or other liquid therein so as to prevent or inhibit such mud or liquid from spilling onto the derrick floor, and for subsequently opening the drill pipe to a full inside diameter for performing well operations therethrough.

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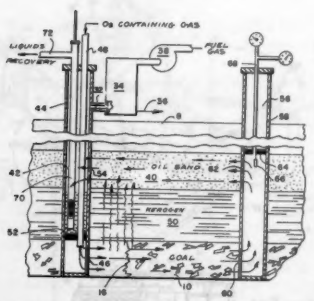
3,599,714

## METHOD OF RECOVERING HYDROCARBONS BY IN SITU COMBUSTION

Roger L. Messman, 1432 Wichita Plaza Bldg., Wichita; Karl E. Becker, 419 First National Bank Bldg., Wichita, Kans., and Henry C. Messman, 31 Ellsworth Road, Larchmont, N.Y.

Filed Sept. 8, 1969, Ser. No. 862,617
Int. Cl. E21b 43/24
U.S. Cl. 166—258 12 Claims




The invention provides a method for recovering hydrocarbons from a geological formation having combustible organic material. A passageway is established from a point in the formation, through same, and to the surface of the ground. The combustible organic material is ignited. Oxygen-containing gas is passed into the resulting combustion zone by establishing at lower than normal formation pressure, a pressure drop from the combustion zone to a point outside the formation through the passageway. The temperature of combustion is controlled to only partially volatilize the organic material. The gases resulting from the partial combustion are passed to the surface of the ground. The method is preferred to recover hydrocarbons and other chemicals from a coal stratum and/or from an oil sand. In the preferred specific embodiment, the method is applied to recovering hydrocarbons from a coal stratum and a separate oil sand stratum, separated by a stratum of kerogen. In the latter heat of combustion is by conduction passed from the coal stratum to the oil sand stratum.

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3,599,715

## USE OF SURFACTANT FOAM FOR RECOVERY OF PETROLEUM

Wayne O. Roszelle, Littleton, Colo., assignor to Marathon Oil Company, Findlay, Ohio

Filed Feb. 18, 1970, Ser. No. 12,457
Int. Cl. E21b 43/22
U.S. Cl. 116—273 16 Claims

Water-external micellar dispersions containing hydrocarbon, surfactant, and 50—95 percent by volume water are contacted with a gas (e.g. air or nitrogen) to form a stable foam which is then injected into and displaced through an oil-bearing reservoir to recover crude oil. The foam may be generated in situ as well as on the surface.

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3,599,716

## METHOD FOR SECONDARY OIL RECOVERY

James L. Thompson, Tulsa, Okla., assignor to Atlantic Richfield Company

Filed Apr. 9, 1969, Ser. No. 814,803
Int. Cl. E21b 43/22
U.S. Cl. 166—273 12 Claims

A secondary oil recovery method which comprises successively injecting into a subterranean oil-bearing formation air and water, e.g. as alternate slugs. The water has dissolved therein a surfactant and an acid or base to increase the efficiency of the surfactant.

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3,599,717

## ALTERNATE FLOOD PROCESS FOR RECOVERING PETROLEUM

James M. McMillen, Arlington, Tex., assignor to Mobil Oil Corporation

Filed Dec. 3, 1969, Ser. No. 881,871
Int. Cl. E21b 43/22
U.S. Cl. 166—273 7 Claims

The specification discloses a process for recovering petroleum from a subterranean reservoir. Gas is injected into the reservoir to establish a free-gas phase in at least a portion of the reservoir. Gas and water are then injected simultaneously into the reservoir and fluids are produced therefrom. The alternate gas and simultaneous gas-water injection steps are repeated until production drops below an economic level.

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3,599,718

## ELECTROLESS METAL BONDING OF UNCONSOLIDATED FORMATIONS

Edwin A. Richardson, and Robert S. Torrest, both of Houston, Tex., assignors to Shell Oil Company, New York, N.Y.

Filed June 20, 1969, Ser. No. 835,243
Int. Cl. E21b 33/138
U.S. Cl. 166—292 5 Claims

A method of consolidating an incompetent or unconsolidated earth formation, over a wide temperature range, by subjecting the formation to an electroless metal-plating process wherein prior to metal binding and consolidating it the formation is activated with an activating colloidal metal forming solution having a pH within the range of from 4 to 5

and containing a viscosity-enhancing material capable of suspending the colloidal particles in solution.

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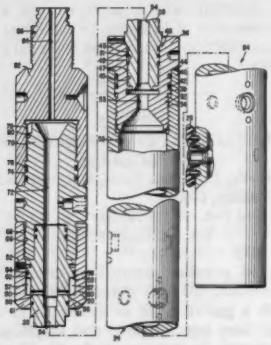
**3,599,719**
**METHOD AND APPARATUS FOR PROVIDING CLEAN PERFORATIONS IN A WELL BORE**
**Jack E. Brown, Houston, Tex., assignor to Halliburton Company, Duncan, Okla.**
**Filed Jan. 9, 1970, Ser. No. 1,820**
**Int. Cl. E21b** *43/116*
**U.S. Cl. 166—297** **20 Claims**



A method is provided for perforating the casing of a well and for sealing an isolated flow path from the formation adjacent the casing through the casing wall and into the perforating tool. The tool may be lowered by a cable into a well bore. The tool is permitted relatively free movement in the direction transverse to the axis of the bore. Formation-perforating guns are disposed within the tool and resilient elastomeric sealing pads are mounted on the outside of the tool generally coaxial with the barrel portions of the guns. As each gun is fired and the formation perforated, a pressure differential is applied across the sealing pad due to the pressure of the hydrostatic fluids surrounding the tool being substantially higher than the pressure of the fluids within the formation. The pressure differential immediately flexes the outer lips of the seal toward the casing wall adjacent the perforation site to form a seal therewith. The seal, in turn, pulls the tool transversely across the well bore toward the perforation. The pressure differential created by the perforation thereby secures the tool against the casing wall. To release the tool from the casing, a slide valve may be actuated by a vertically upward pull on the cable which actuation causes annular, high-pressure, hydrostatic fluids to enter the low-pressure space on the formation side of the seal so as to equalize the pressure and release the holding force produced thereby.

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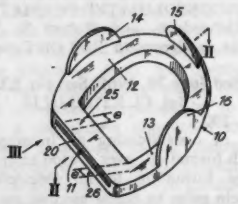
**3,599,720**
**ADJUSTABLE SIZE HORSESHOE**
**Pierre Mathern, Paris, France, assignor to Samuel Lahmani, Paris, France**
**Filed July 1, 1969, Ser. No. 838,224**
**Claims priority, application France, July 5, 1968, 158,195**
**Int. Cl. A01l** *01/00, 03/00*
**U.S. Cl. 168—4** **8 Claims**



A horseshoe has a rear transverse portion made of at least two superimposed parts of a material that can be cut off for width adjustment of the shoe and then secured in superimposed relation for providing a unitary plate bridging the rear ends of the side limbs of the horseshoe when adjustment of the shoe width has been made.

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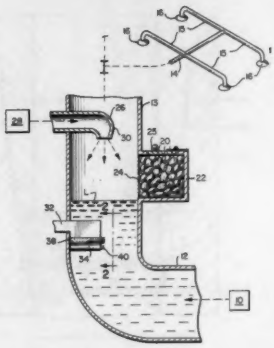
**3,599,721**
**FLUID CONTROL SYSTEM**
**William L. Livingston, Sharon, Mass., assignor to Factory Mutual Research Corporation**
**Filed Aug. 11, 1969, Ser. No. 848,987**
**Int. Cl. A62c** *35/00*
**U.S. Cl. 169—8** **14 Claims**



A fluid control system in which a predetermined level of fluid is maintained in a conduit by varying the pressure in the conduit in response to variations in the fluid level. When the fluid level exceeds the predetermined level a powder disposed in a fluid flow relationship with the conduit is wetted by the fluid to produce a gas which causes the pressure in the conduit to exceed the pressure of the fluid, and thus reduce the level of the fluid to the predetermined level. When the fluid level drops below a predetermined level as a result of an increased pressure in the conduit, the conduit is vented to atmosphere to reduce the pressure and raise the fluid level.

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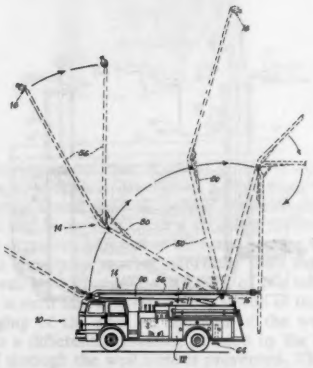
**3,599,722**
**REMOTELY CONTROLLABLE FIRE FIGHTING APPARATUS**
**Kenneth H. Davidson, and Carrol V. Morris, both of Saint Joseph, Mo., assignors to Snorkel Fire Equipment Company**
**Filed Dec. 31, 1968, Ser. No. 788,200**
**Int. Cl. A62c** *27/00*
**U.S. Cl. 169—24** **12 Claims**



A remotely controllable, boom-supported water delivery monitor and nozzle assembly particularly adapted for fire-

fighting apparatus, and having independently operable nozzle sweep and vertical travel functions, and remotely controllable flow rate adjustment and spray pattern adjustment, all hydraulically operable from a remote control panel.

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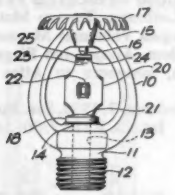
**3,599,723**
**FUSIBLE ELEMENT FOR CENTER STRUT SPRINKLERS**
**Theodore Vorkapich, Brunswick, Ohio, assignor to ATO Inc., Cleveland, Ohio**
**Continuation-in-part of application Ser. No. 690,957, Dec. 15, 1967, now Patent No. 3,498,383, and a continuation-in-part of 803,391, Feb. 28, 1969. This application Dec. 3, 1969, Ser. No. 881,713**
**Int. Cl. A62c *37/12***
**U.S. Cl. 169—39** **4 Claims**




An improved fusible element for a fire extinguishing sprinkler comprising a frame having a discharge orifice and a spaced oppositely disposed deflector and means positioned therebetween normally closing the discharge orifice and responsive in opening to predetermined heat conditions wherein opposed cylinders holding fusible material are spaced by a piston movable to displace the fusible material on said predetermined heat conditions occurring.

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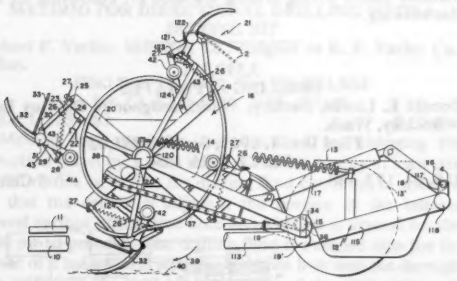
**3,599,724**
**ROCK PICKER**
**Harry Fraske, 1813 Pettigrew Road, and Alfred Fraske, 260 Duncan Road, both of Estevan, Saskatchewan, Canada**
**Filed Aug. 8, 1969, Ser. No. 848,589**
**Claims priority, application Great Britain, Aug. 26, 1968, 40765/68**
**Int. Cl. A01b *43/00***
**U.S. Cl. 171—63** **8 Claims**



A pickup reel has teeth and retainers which move upwardly when an obstruction is engaged. They are positioned by outer and inner cam tracks for optimum operational positioning. The reel is positioned by hydraulic piston and cylinder assemblies which also dump the stone bucket when the lowermost position of the reel is reached and the piston and cylinder assemblies are further extended.

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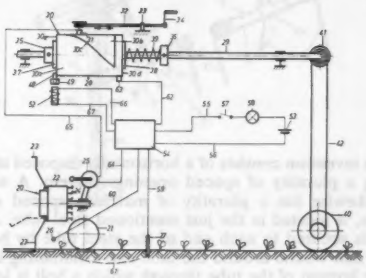
**3,599,725**
**ROW-TYPE AGRICULTURAL APPARATUS FOR THINNING, HOEING OR SPRAYING OF PLANTS**
**Arnold Gego, 67, Soerser Weg, Aachen, and Heinrich Gugenhan, 53, Schulstrasse, Duren, both of, Germany**
**Continuation-in-part of application Ser. No. 549,033, May 10, 1966, now Patent No. 3,452,822. This application June 19, 1969, Ser. No. 834,821**
**Int. Cl. A01b *41/04*; H01h *1/00***
**U.S. Cl. 172—6** **15 Claims**



Control for a row cultivator having a selectively activatable cultivating tool for operation along specified portions of a row by activation of a rotary magnet with the magnet control including a rotary cylindrical control member driven through friction drive means by a ground-engaging means at a rate proportional to the speed of movement of the cultivator along the row with the control cylinder having conductive and nonconductive surfaces of varying length at different axial positions along the cylinder engageable with a contact for controlling the length of cultivation for a given revolution of the cylinder.

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**3,599,726**
**EDGING TOOL**
**Leonard D. Iacurci, 3701 Wenzler Drive, Kettering, Ohio**
**Filed June 9, 1969, Ser. No. 831,454**
**Int. Cl. A01b *45/00, 1/00***
**U.S. Cl. 172—17** **3 Claims**

An edging tool for trimming a lawn along the edges of curbs, walks and areas adjacent walls, steps or the like. The edging tool includes an operating handle or stem, a cutting member secured thereto adjacent one end thereof, and a rotatable wheel for support of the stem and cutting member. The cutting member has a first cutting edge and a second cutting edge. The cutting edges are arranged so that one cutting edge is used when the edging tool is moved in one

direction, and the other cutting edge is used when the edging tool is moved in the opposite direction. Thus, the trimming of lawns near abutments such as steps, walls, or the like may be accomplished easily and readily.

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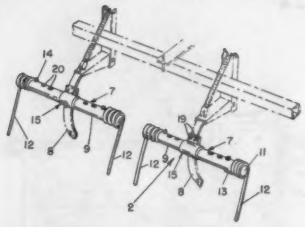
**3,599,727**
**HARROW ATTACHMENT FOR CULTIVATORS**
**Robert B. Gates, Route 2, Loraine, N. Dak.**
**Filed Nov. 4, 1968, Ser. No. 772,892**
**Int. Cl. A01b** *33/02, 23/02*
**U.S. Cl. 172—142** **1 Claim**



This invention consists of a horizontally disposed steel tube having a plurality of spaced openings therein. A steel bar, that likewise has a plurality of matching spaced openings therein, is located in the just mentioned steel tube. A spring tooth is secured to each end of the steel tube by having its upper end wound around the tube and terminating in a loop on the bottom of the tube through which a bolt is located in one of the aforesaid openings. A steel fitting, which embodies a tube through which the first mentioned steel tube is slidably passed, provides a means of securement by two bolts to one of the spring tooth shanks of a cultivator, which may have any number of these inventions secured thereto.

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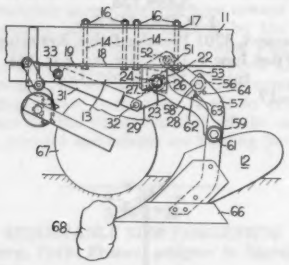
**3,599,728**
**PLOW TRIP MECHANISM**
**Richard G. Moe, La Crosse; Gerald E. Sieren, Greendale, and Maynard E. Walberg, Waukesha, all of, Wis., assignors to Allis-Chalmers Manufacturing Company, Milwaukee, Wis.**
**Filed Sept. 25, 1968, Ser. No. 763,056**
**Int. Cl. A01b** *61/04*
**U.S. Cl. 172—265** **4 Claims**



A safety trip mechanism for a plow which permits a plow to raise up, move rearwardly and pivot upon striking a buried object and which mechanism returns the plow to operative position after the object has been cleared.

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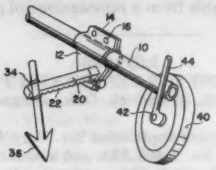
**3,599,729**
**CULTIVATOR SHANK AND DISC SETTER**
**Ralph J. Greemore, Route 5, Box 173, Vincennes, Ind.**
**Filed June 25, 1969, Ser. No. 836,301**
**Int. Cl. A01b** *23/00*
**U.S. Cl. 172—741** **5 Claims**

An apparatus for use on a cultivator comprises a support clamp mounting on elongated bar to which an earth working element is affixed. The support element also mounts a spring biased pin between a locked position wherein the pin engages an indentation in the bar to lock the latter in a fixed position and a nonlocked position wherein said pin is free of said bar and the latter may be slid longitudinally relative to the support clamp to adjust the position of the earth-working element.



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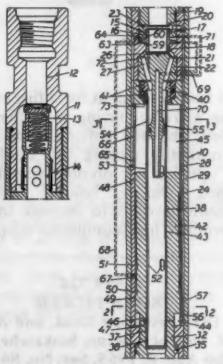
**3,599,730**
**PRESSURE FLUID OPERATED PERCUSSION TOOL**
**Per Janne Olov Luthman, Tyreso; Matti Juhani Koskimaki, Nacka; Karl August Valdemar Magnusson, Klinten; Robert Mauritz Sandblom, Alvsjo, and Birger Zettergren, Nacka, all of, Sweden, assignors to Atlas Copco Aktienbolag, Nacka, Sweden**
**Filed Jan. 7, 1970, Ser. No. 1,207**
**Int. Cl. E21b** *1/00, 5/00*
**U.S. Cl. 173—73** **17 Claims**



In a down-the-hole percussion drill, the exhaust power fluid is used as a flushing fluid during drilling. When the drill is suspended off bottom, the drill bit and with it the hammer piston drops into an exceptional forward position so that drilling ceases automatically and an uninterrupted blowing with fluid starts under full line pressure. The passages for supplying fluid for providing the power strokes of the hammer piston during drilling are used for conveying air for this blowing.

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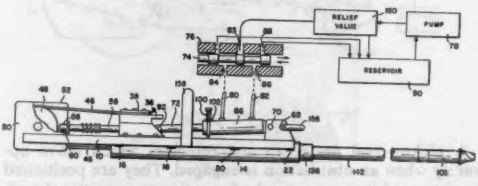
**3,599,731**
**DRILLING APPARATUS**
**Donald E. Lawlis, Buckley, Wash., assignor to Del-Guy Inc., Buckley, Wash.**
**Filed Dec. 1, 1969, Ser. No. 881,027**
**Int. Cl. E21b** *1/04*
**U.S. Cl. 173—88** **5 Claims**




Drilling apparatus adapted for setting electrical conduits in place under roadways comprises a bit mounted in a subas-

sembly for movement along the axis of drilling as well as for rotational movement, a spring-operated hammer within the subassembly adapted to impart a blow to the bit in the direction of drilling, a cable attached to the hammer and extending through conduit sections being set in place to a hydraulically operated mechanism for withdrawing the cable against the force of the spring and suddenly releasing the cable.

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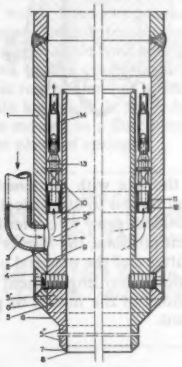
**3,599,732**

**METHOD FOR PROVIDING A HOLE IN THE SOIL AS WELL AS A DEVICE FOR APPLYING SAID METHOD**

**Jacob Kroon, Gouda, Netherlands, assignor to N.V. Tot Aanneming Van Werken Voorheen H.J. Nederhorst, Gouda, Netherlands**

**Filed Sept. 5, 1969, Ser. No. 855,528**
**Claims priority, application Netherlands, Sept. 5, 1968, 6,812,692**
**Int. Cl. E21b** *11/02, 49/00*
**U.S. Cl. 175—20** **20 Claims**



A method and a device for providing a hole in the soil, for example for forming a foundation element, an earth-retaining wall or a water-retaining wall or the like in the soil, wherein a hollow pipe open at the lower end is introduced into the soil and the earth penetrated into the pipe is removed from the pipe.

According to the invention the removal of the earth from the pipe is effected by a pressure fluid which is supplied to the pipe near the lower end of the pipe, and which forces the earth in the pipe upwards as a column.

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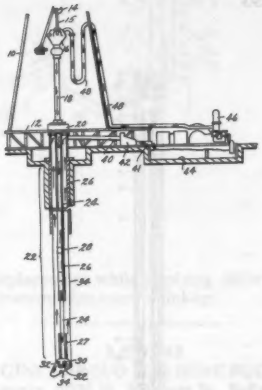
**3,599,733**

**METHOD FOR DIRECTIONAL DRILLING WITH A JETTING BIT**

**Robert F. Varley, Metairie, La., assignor to R. F. Varley Co., Inc.**

**Filed Dec. 15, 1969, Ser. No. 884,804**
**Int. Cl. E21b** *7/08, 7/18, 17/046*
**U.S. Cl. 175—61** **8 Claims**

Method and apparatus are described for changing the direction taken by a bore hole. A drill bit having at least one outlet orifice or nozzle for drilling fluid e,g, mud, is oriented so that the orifice is adjacent the portion of the interior lateral surface of the bore hole into which it is desired for the drill bit to proceed. The drilling fluid is pumped into the interior of a hollow drill string in the bore hole and out through the orifice in the drill bit. A portion of the drill string adjacent the bit is adapted to be closed in a fluidtight manner by means of a back pressure ball valve, and the portion of the drill string between the valve and the outlet orifice includes a slip joint adapted to be decreased in volume by an inward telescoping motion with vertical reciprocation of the drill string. Decreasing the volume of the drill beneath the above-mentioned valve will serve to compress the fluid therein forcing it out of the outlet orifice at an increased velocity. When the drill string is moved vertically upwardly, the valve opens allowing more drilling fluid to flow therethrough. Repetitive



vertical reciprocation of the drill string to open and close the slip joint will result in highly accelerated jetting velocities through the outlet orifices in the drill bit.

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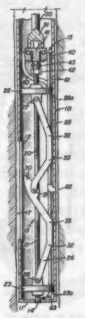
**3,599,734**

**NOTCHING TOOL**

**Nathandale Farris, 1500 North Woodland Road, and Tibor O. Edmond, 304 North Sixth St, both of Ponca City, Okla.**

**Filed Aug. 6, 1969, Ser. No. 847,913**
**Int. Cl. E21b** *9/26*
**U.S. Cl. 175—173** **3 Claims**

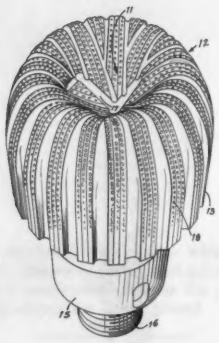


An apparatus for forming a biconical notch by moving a symmetrical extendable cutter out of a rotating drill casing into the formation. Once the biconical notch is completed, the extending device can be retracted back into the drill casing and the casing removed.

3,599,735
**BUMPER SUB AND CLOSED FLUID CIRCULATION ASSEMBLY**
Damon T. Slator, Houston, Tex.; William T. Lee, Harvey, La., and Archie W. Pell, Houston, Tex., assignors to Bowen Tools, Inc.
Filed Jan. 22, 1970, Ser. No. 5,008
Int. Cl. E21b *1/10*
U.S. Cl. 175—293 10 Claims

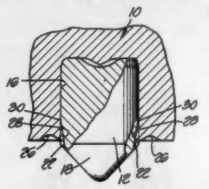
A bumper sub and closed fluid circulation assembly wherein the assembly is adapted to be connected in a pipe string having means for closed fluid circulation to provide for limited telescoping movement within the pipe string, and for bumping action as desired.

3,599,736
**ROTARY DRILL BIT**
Charles T. Thompson, Dallas, Tex., assignor to American Coldset Corporation, Dallas, Tex.
Filed May 18, 1970, Ser. No. 38,112
Int. Cl. E21b *9/36*
U.S. Cl. 175—329 16 Claims



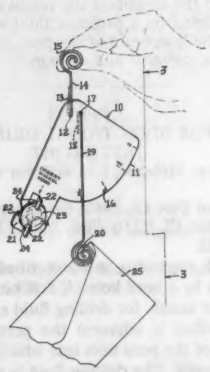
A rotary bit for drilling earth formations of the type having an elongated cylindrical body and an enlarged head having wear-resistant abrasive particles embedded therein to form a cutting surface. An improved cutting surface comprises a concave face, a convex annular tapered crown faired into the face at its inner limit and a cylindrical skirt extending a substantial axial distance from the outer limit of the crown. Wear-resistant abrasive particles are embedded in substantially parallel rows upon the surfaces of an odd number of cutting lands substantially equally spaced about the skirt and crown and terminating assymmetrically in the face region. Drilling fluid is conveyed by an inner passageway through the body of the bit to a Y-shaped outlet on the face and thence uniformly to the cutting surfaces through primary waterways between the lands and secondary waterways between the rows of wear-resistant particles.

3,599,737
**ANCHORED HARDENED CUTTER INSERTS**
John F. Fischer, Los Alamitos, Calif., assignor to Smith International, Inc., Newport Beach, Calif.
Filed Mar. 2, 1970, Ser. No. 15,682
Int. Cl. E21b *9/36;* E21c *13/01*
U.S. Cl. 175—374 6 Claims



A drilling tool or the like with hardened metal inserts of molded sintered metal turned to cylindrical shape by centerless grinding and provided, prior to centerless grinding, with out-of-round abutment portions, the inserts being press fitted into cavities in the cutter and the material of the cutter being staked to displace metal into engagement with the out-of-round abutment portions of the inserts to prevent axial and rotational displacement.

3,599,738
**PORTABLE LETTER POSTAGE SCALE**
Chester H. Wickenberg, 164 Division, Elgin, Ill.
Filed Mar. 12, 1970, Ser. No. 18,836
Int. Cl. G01g *21/00*
U.S. Cl. 177—126 6 Claims



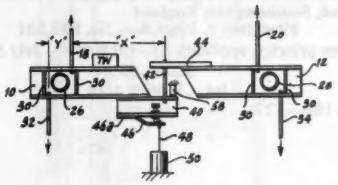
An economical portable letter postage scale having a support for a counterweight, the support being formed from a relatively flat sheet of material suspended from a handle at one corner thereof and relative to which handle the sheet pivots under action of the counterweight to dispose an envelope holder pivotally carried by the sheet, to a position of registration with a scale calibration on the sheet to designate the weight of such envelope and its contents and thereby determine the required postage.

3,599,739

## OVERLOAD PROTECTION FOR STRAIN GAUGE LOAD CELLS USED IN WEIGH SCALE LOAD MEASUREMENT

Frank S. Hyer, Duxbury, Mass., assignor to Cutler-Hammer, Inc., Milwaukee, Wis.

Filed May 6, 1970, Ser. No. 35,113
Int. Cl. G01g 3/14
U.S. Cl. 177—211 5 Claims



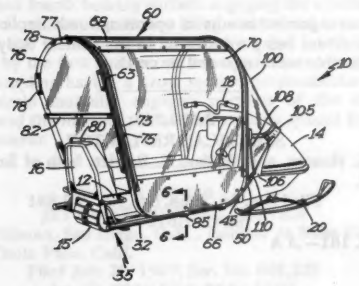
An overload protective arrangement for strain gauge type load cells used in weigh scale force measurement. Calibrated springs are interposed in the tension coupling between the load cell and the weigh scale load resolving lever to provide an inextensible link in the coupling until the designed load limit of the scale is reached and as a progressively extensible link when the scale load limit is exceeded. Another embodiment uses a piston moving in a fluid pressure cylinder as part of such coupling in place of springs.

3,599,740

## SNOWMOBILE CAB ASSEMBLY

Werner W. Martinmaas, 835 Tenth Ave. N.W., Watertown, S. Dak.

Filed Apr. 29, 1969, Ser. No. 820,125
Int. Cl. B62m 27/02; B62d 33/06
U.S. Cl. 180—5 R 17 Claims



A snowmobile cab assembly adapted to be used universally on all snowmobile models. The cab assembly includes a slidable cab mounted on a frame attached to the snowmobile with the cab frame and the mounting frame providing a roll bar structure for safety purposes in snowmobile operation. The cab assembly is demountable and may mount the windshield for the snowmobile if desired.

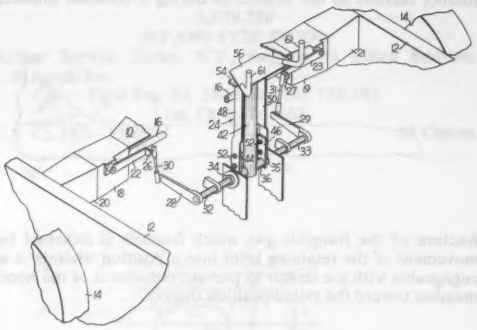
3,599,741

## DRIVE AND STEERING MECHANISM FOR WHEELED VEHICLES

LeRoy Langford, La Porte, Ind., assignor to Allis-Chalmers Manufacturing Company, Milwaukee, Wis.

Filed Aug. 11, 1969, Ser. No. 848,859
Int. Cl. B62d 11/04
U.S. Cl. 180—6.48 5 Claims

A swather having two drive wheels which are hydraulically operated by individual variable displacement pumps and motors and wherein such pumps are controlled by a movable steering column rotatably mounting a manual steering control member which is operatively connected to the transmission control linkage by means of auxiliary linkage including a pair of laterally spaced control members which are capable of lateral displacement while applying differential displacement to the transmission control linkage.

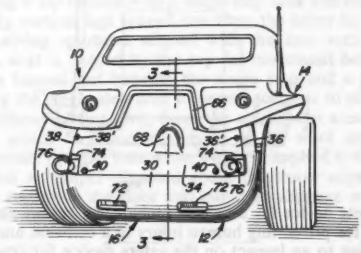


3,599,742

## ENGINE SHROUD FOR DUNE BUGGIES

Jimmie L. Lowery, 4005 W. Madison St., Bellwood, Ill.

Filed July 29, 1969, Ser. No. 845,732
Int. Cl. B62d 25/10
U.S. Cl. 180—69 R 8 Claims



A vehicle body rear closure for a rear engine "Dune Buggy" of the type provided with a chassis mounted abbreviated body structure and serving not only as a protective closure for the rear mounted engine of a "Dune Buggy," but also as a structure operative to control the flow of cooling air about the air-cooled engine of the vehicle whereby adequate cooling on hot days as well as heat retention on cold days is afforded. Further, the closure may also function as an engine skid plate. The closure includes first and second sections. The first section is constructed to be semipermanently attached to the associated "Dune Buggy" and includes opposite sidewalls interconnected at their bottom and lower rear marginal rear edge portions by means of integral bottom and partial lower rear walls, respectively. The second section defines an upper rear wall portion and includes opposite side and lower edge portions readily removably supported from the rear marginal edge portions of the sidewalls and the upper marginal edge portion of the partial lower rear walls, respectively, of the first section for ease in servicing the engine of the vehicle.

3,599,743

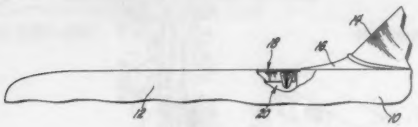
## CLOSURE HOLDDOWN ARRANGEMENT

Neil A. Hull, Birmingham, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Oct. 20, 1969, Ser. No. 867,447
Int. Cl. B62d 25/10
U.S. Cl. 180—69 C 3 Claims

A vehicle including a hood member mounted thereon for swinging movement relative thereto about a forward axis between raised and lowered position has a striker mounted on the hood member, a retaining lever pivotally mounted on the vehicle and a frangible pin connection between the vehi-

cle and retaining lever maintaining the latter in a fixed orientation relative to the former. In the normal lowered position of the hood member, rearward longitudinal movement thereof relative to the vehicle as during a collision initiates




fracture of the frangible pin which fracture is followed by movement of the retaining lever into a position wherein it is engageable with the striker to prevent movement of the hood member toward the raised position thereof.

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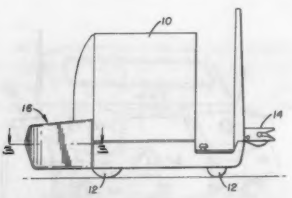
**3,599,744**

## VEHICLE SAFETY DEVICE

**Rigsby C. Satterfield, Jenkintown, and Thomas J. Ballantyne, Chalfont, both of, Pa., assignors to Eaton Yale & Towne Inc., Cleveland, Ohio**

**Filed May 2, 1969, Ser. No. 821,205**
**Int. Cl. B60k *27/08*; B60l *3/04***
**U.S. Cl. 180—96** **9 Claims**




A safety device for a vehicle includes an energy-absorbing portion for preventing human injury in a collision and means responsive to an impact on the safety device for controlling operation of the vehicle.

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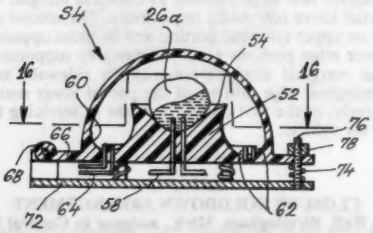
**3,599,745**

## GRAVITY SAFETY SWITCH

**Benjamin F. Hughes, Route 1, Box 120, Morris, Ala.**

**Filed July 28, 1969, Ser. No. 845,278**
**Int. Cl. H01h *35/02*; B60k *15/00***
**U.S. Cl. 180—104** **10 Claims**




A gravity operated switch includes a movable electrically conductive member in a housing. The conductive member bridges a pair of fixed spaced electrical contacts. When the housing is tilted the movable conductive member moves off or out of contact with the electrical contacts to open an associated electric circuit. The switch has particular utility in tractors and other machines to stop operation when the machine is tilted to an unsafe operating position. The switches control flow of fuel to the engines of the machines, ignition, or other engine control components.

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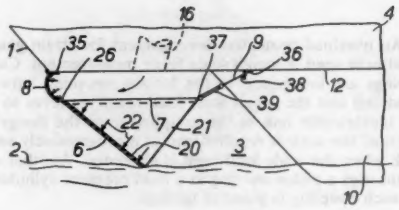
**3,599,746**

## GAS CUSHION VEHICLES

**Raymond Leslie Davis, Southampton; Daniel Cecil Edward Fish, Brockenhurst, and Ronald Christopher Fishlock, Southhampton, all of, England, assignors to Hovermarine Limited, Southampton, England**

**Filed July 7, 1969, Ser. No. 839,501**
**Claims priority, application Great Britain, July 5, 1968, 32086/68**
**Int. Cl. B60v *1/16***
**U.S. Cl. 180—127** **4 Claims**




An air cushion vehicle is provided with a flexible skirt for containing at least part of the vehicle-supporting cushion. The skirt comprises a succession of contiguous skirt members flexibly suspended beneath the vehicle body by a series of flexible straps attached to the upper areas of the skirt members, a flexible wall extending between the straps and an outer part of the vehicle body and a series of tie cords extending between the straps and an inner part of the vehicle body.

The arrangement results in operating loads applied to the skirt members being transferred to the vehicle body by way of the flexible wall straps and tie cords.

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**3,599,747**

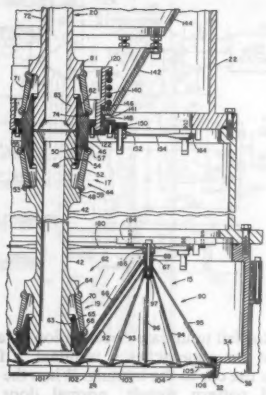
## SPHERICAL REFLECTOR

**Palle G. Hansen, and William E. Batzler, both of San Diego, Calif.**

**Filed Dec. 16, 1968, Ser. No. 783,881**
**Int. Cl. G01k *11/00***
**U.S. Cl. 181—.5 A** **3 Claims**

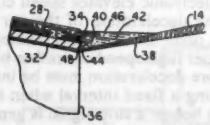
A dish-shaped acoustic reflector for use with a sound source, the reflector having a spherical surface for reflecting the desired echoes back toward the sound source in a narrow beam enhancing the strength, stability, and concentration of the received signal, said reflector accepting signals from sound sources over a predetermined angular range and wide frequency range.

3,599,748
COUPLING
Caperton B. Horsley, East Walpole, Mass., assignor to Braxton Corporation, Medfield, Mass.
Filed Nov. 13, 1969, Ser. No. 876,322
Int. Cl. G01v 1/00
U.S. Cl. 181—.5 EM 10 Claims



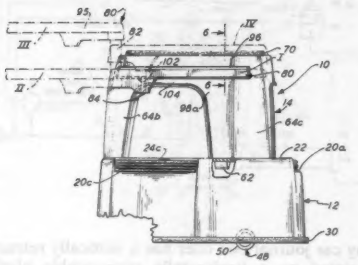
A coupling comprising a first threaded member bearing external threads and providing a first bearing surface adapted to deliver a force substantially parallel to the axis of the threads, a second threaded member bearing internal threads threadedly engaged to the first threaded member, the second threaded member providing a second bearing surface adapted to deliver a force substantially parallel to the axis and directed in the direction opposite to the force delivered by the first bearing surface, and a stress member providing a third bearing surface engaging the first bearing surface and an opposed fourth bearing surface engaging the second bearing surface, the stress member being maintained in a state of stress by the forces applied to the third and fourth bearing surfaces by the first and second bearing surfaces, respectively; the coupling having a cross section perpendicular to the axis wherein mutually engaged portions of the external threads and the internal threads are radially spaced from the stress member.

3,599,749
JET NOISE CONTROL SYSTEM
Victor Millman, San Diego, Calif., assignor to Rohr Corporation, Chula Vista, Calif.
Filed July 28, 1969, Ser. No. 845,229
Int. Cl. F01n 1/14; B64d 33/06
U.S. Cl. 181—33 HC 18 Claims



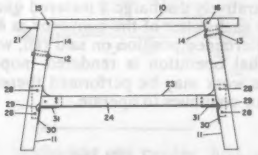
Jet engine exhaust nozzle is surrounded at its exit margin with multiplicity of small jet discharge ducts which direct discrete small jets of gas rearwardly in a ring surrounding the jetstream. These jets intercept the expanding boundary of the jetstream immediately behind the nozzle and produce small eddy turbulence with lower sound energy level and higher frequency level. Gas is supplied by bleed from compressor or turbine through shell surrounding nozzle. In form shown, tailpipe boundary layer is drawn off to improve engine efficiency. Gas jets travel at velocity between those of jetstream and free air, reducing shearing forces and consequent sound energy and producing two mixing zones.

3,599,750
SIT AND STEP STOOL
Arthur Serwer, Jerico, N.Y., assignor to Litton Business Systems, Inc.
Filed Dec. 24, 1968, Ser. No. 786,691
Int. Cl. A47c 9/02
U.S. Cl. 182—15 20 Claims



A two-step stool, with a base having three-step areas and mounting a top formed with a single step area and three substantially vertical legs spaced one from the other to provide feet-receiving apertures aligned with the step area on the base. A seat is carried by the top for movement between a position housed just beneath the single step and a position covering the single step area to permit the user to sit on the stool without getting dirty from the single step area. Three wheels, which facilitate movement of the stool about the floor, retract into the base when weight is applied to the stool to permit a bumper disposed about the lower edge of the base to rest upon the floor and minimize slippage when the stool is in use.

3,599,751
COLLAPSIBLE SAWHORSE AND TRAY
Bert A. Mueller, 1821 W. Oakdale Ave., Chicago, Ill.
Filed June 22, 1970, Ser. No. 48,112
Int. Cl. E04g 1/32; F16m 11/00
U.S. Cl. 182—129 4 Claims



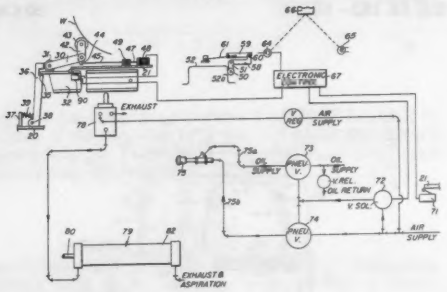
A collapsible sawhorse comprising a beam, leg-supporting brackets having downwardly diverging sides, said sides defining leg receiving channels, legs mounted pivotally in said channels for movement lateral to the beam, the brackets being pivotally mounted on the beam so that each bracket and the legs attached to it are movable in conjunction from a folded position contiguous and parallel to the beam to an extended position at substantially right angles to the beam. The legs of the sawhorse may be adapted to support a tray at about their vertical midpoints.

3,599,752

## AUTOMATIC RAILWAY CAR JOURNAL OILER

William Bowler, Pierrefonds, and Raymond E. Kalita, Dollard des Ormeaux, both of Quebec, Canada, assignors to Canadian National Railway Company, Montreal, Quebec, Canada

Filed Mar. 17, 1969, Ser. No. 807,880
Claims priority, application Canada, Feb. 12, 1969, 042,763
Int. Cl. B61k 3/00; F16n 1/00
U.S. Cl. 184—3 R 8 Claims




A railway car journal box oiler has a vertically retractable nozzle mounted on a horizontally reciprocable platform, movement of which with the car is caused by engagement of a car wheel with a vertically retractable roller moved to an upper position by a solenoid when the approach of an open journal box is sensed by a photocell. The roller and nozzle automatically retract after a predetermined amount of movement of the platform with the car. The nozzle is automatically moved to an upper, operative position as the platform starts to move and ejection of oil from the nozzle is in timed relationship with nozzle movement.

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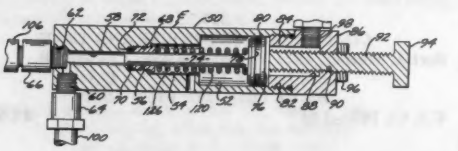
3,599,753

## CONVEYOR ROLLER LUBRICATING DEVICE

Warren J. Walsh, 1856 E St., Long Beach, Calif.

Filed July 14, 1969, Ser. No. 841,220
Int. Cl. F16n 7/00, 13/16
U.S. Cl. 184—15 A 3 Claims



A conveyor rail-supported device provided with an air-operated reciprocating pump and a multiposition air valve which cooperatively discharge a metered quantity of a liquid lubricant on each roller of the conveyor as said roller moves past a predetermined position on said rail, which device by a simple manual operation is rendered inoperative whereby maintenance work may be performed thereon, even though said conveyor continues to operate.

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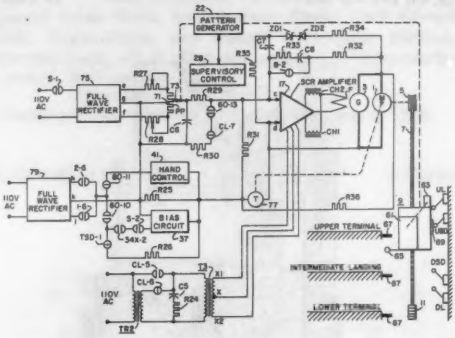
3,599,754

## MOTOR CONTROL SYSTEM

William R. Caputo, Wyckoff, and William M. Ostrander, Hackensack, both of, N.J., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed June 30, 1969, Ser. No. 845,604
Int. Cl. B66b 1/30
U.S. Cl. 187—29 R 12 Claims

In a direct current drive system for an elevator, a high-gain amplifier controls the speed of the motor through variable energization of the generator field in accordance with an error signal developed as a function of the difference between a signal developed by a pattern generator and a signal developed by a tachometer. Switchless feedback circuits are provided to bring the car smoothly to a creep speed should the pattern generator or tachometer generator fail as an open circuit. A noncontinuous feedback circuit and variable damping on the pattern generator minimize jerk on one floor runs but do not interfere with leveling. Should the pattern generator fail to initiate deceleration by a predetermined point as the car approaches a terminal, a fixed low speed signal brings the car to the landing. When the car is operating on reduced pattern signals, normal door preopening is discontinued.

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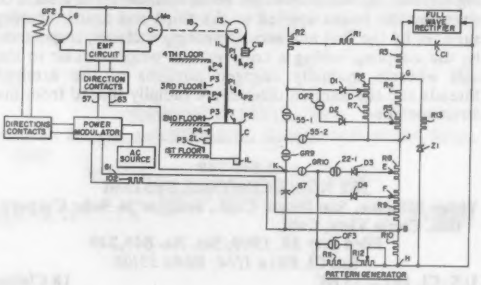
3,599,755

## ELECTRONIC ELEVATOR SPEED CONTROL

Alvin O. Lund, Little Falls; Milton Fink, Rochelle Park, N.J., and Stephen J. Greenfield, Rochester, N.Y., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Nov. 25, 1969, Ser. No. 879,727
Int. Cl. B66b 1/28
U.S. Cl. 187—29 R 6 Claims




An improved electronic elevator speed control of the type which controls the deceleration of the car as a function of time from a fixed point short of each landing, accommodates for short runs under high-speed operation where full speed is not obtained before deceleration must be initiated. If a timer, which begins timing a fixed interval when the car is started, does not time out before a stop signal is generated, the speed of the car is limited and the RC time constant of the circuit which controls the deceleration of the car from the fixed point short of the landing is adjusted to provide a slower rate of deceleration. A substantially constant rate of acceleration is achieved regardless of the speed to which the car is being accelerated by charging a pattern-generating capacitor toward a voltage in excess of the maximum speed desired and then limiting the charge on the capacitor by connecting clamping diodes between the capacitor and taps on a voltage divider having a potential proportional to the desired speed. A resistor in series with a Zener diode shunting the pattern generator power supply accommodates for changes in the motor field current caused by fluctuations in line voltage.

3,599,756

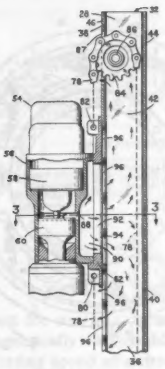
## ROCK DRILL FEED MAST WITH INTEGRAL MUFFLER AND OIL SEPARATOR

Linwood A. Pickle, South Hadley, Mass., assignor to Worthington Compressor and Engine International Division of Worthington Corporation, Holyoke, Mass.

Continuation-in-part of application Ser. No. 854,551, Sept. 2, 1969. This application Apr. 30, 1970, Ser. No. 33,475

Int. Cl. F01n *1/08, 7/08;* B25d *17/12*

U.S. Cl. 181—36 A 8 Claims



A compressed air drill mounted and movable on a guide mast is presented wherein the guide mast is a boxlike structure having a plurality of openings to receive the exhaust from the drill. The guide mast forms part of a muffler and separator system wherein the drill exhaust is muffled and the oil is separated from the air to lubricate drill guides and a drive chain within the guide mast. A muffler element having two spaced plates is located in an expansion chamber between the exhaust ports on the drill and the guide mast. One of these plates is solid and acts as a baffle; the other of these plates is perforated and is placed adjacent to the openings in the guide mast whereby exhaust gases are deflected by the muffler structure and flow around the muffler structure and through the perforated plate.

3,599,757

## ENERGY ABSORBER BY MEAN OF PLASTIC DEFORMATION

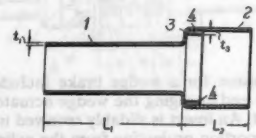
Masanobu Takamatsu, and Hiroshi Tominaga, both of Yokohama-shi, Japan, assignors to Tokyu Sharyo Seizo Kabushiki Kaisha, Yokohama-shi, Kanagawa-ken, Japan

Filed June 9, 1969, Ser. No. 831,571

Claims priority, application Japan, June 25, 1968, Nov. 14, 1968, Nov. 15, 1968, 43/44115; 43/83416; 43/83602

Int. Cl. F16f *7/12;* B62d *1/18*

U.S. Cl. 188—1 C 3 Claims



This invention relates to a device for absorbing energy by means of plastic deformation which, when compressed by an external force or forces, exhibits a certain deformative resistance and, without being fractured, reduces the shock due to the external impact force through continuous and permanent plastic deformation, and more particularly to a machine element buffer as an energy absorber in which a predetermined amount of energy may be absorbed under a certain load with at least possible reduction of length and with no danger of springback after the deformation.

3,599,758

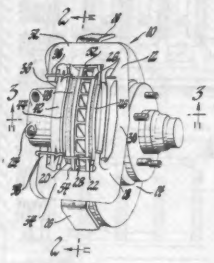
## DISC BRAKE CALIPER

Gary E. Bishop, Warren, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Dec. 12, 1969, Ser. No. 884,453

Int. Cl. F16d *55/224*

U.S. Cl. 188—73.4 3 Claims



A disc brake having a caliper assembly formed of a generally C-shaped member slidably mounted by a tongue-and-groove arrangement on a support bracket, a separate hydraulic cylinder assembly, and a pair of friction pad assemblies mounted on the C-shaped member by means of spring clips which require no close tolerances. One C-shaped member is provided for a series of brakes of different capacities, with different capacity hydraulic cylinder units being provided to fit the one C-shaped housing.

3,599,759

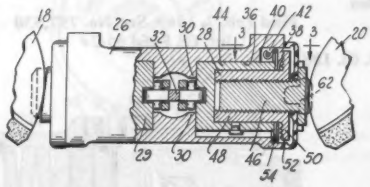
## SIMPLIFIED ADJUSTING MEANS FOR WEDGE BRAKES

Robert R. Hager, South Bend, Ind., assignor to The Bendix Corporation

Filed June 30, 1969, Ser. No. 837,525

Int. Cl. F16d *65/56, 51/52*

U.S. Cl. 188—79.5 GE 3 Claims



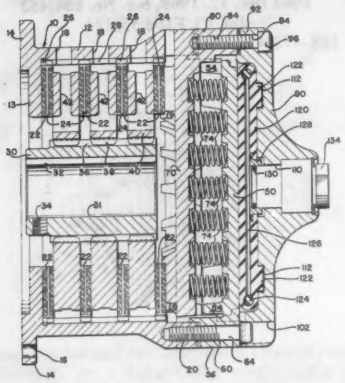
An adjuster mechanism for wedge brakes includes a plunger assembly that carries an adjuster nut coaxially receiving an adjuster screw. The adjuster nut includes a flange having ratchet teeth thereon that engage an upturned pawl integral with a circular spring that is mounted in the housing coaxially with the plunger assembly. The pawl follows the axial movement of the plunger to rotate the adjuster nut to extend the screw from the nut, thereby effecting adjustment of the brakes. However, when "kickback" forces (hereinafter defined) lock the nut and screw against relative rotation, the spring deforms in a radial direction to prevent destruction of the brake. Upon release of the "kickback" forces, the spring releases its radial deformation, rotating the adjuster nut in the normal manner.

3,599,760

## SPRING SET FLUID RELEASE BRAKE

Jack W. Moss, Wichita Falls, Tex., assignor to Wichita Clutch Company, Inc., Wichita Falls, Tex.

Filed Jan. 7, 1969, Ser. No. 789,475
Int. Cl. F16d 65/24, 55/22
U.S. Cl. 188—170 2 Claims



A body means is fixed against rotation and has a plurality of friction plates operatively connected therewith to cooperate with friction plates secured to a rotatable member. A backplate means is secured to the body means. A pressure plate means is secured to a holding plate means, the pressure plate means and holding plate means being axially movable. A plurality of springs is positioned between the backplate means and the pressure plate means for moving the pressure plate means toward brake set position. An axially expansible pancake-type airtube is positioned between the backplate means and the holding plate means for moving the pressure plate means and the holding plate means in a brake release direction against the force of the springs.

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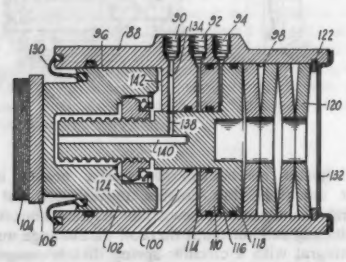
3,599,761

## HYDRAULIC POWER BRAKE SYSTEM

Harold B. Schultz; Keith H. Fulmer, and Richard T. Burnett, all of South Bend, Ind., assignors to The Bendix Corporation

Filed Feb. 7, 1969, Ser. No. 797,530
Int. Cl. F16d 65/24
U.S. Cl. 188—170 5 Claims



This invention relates to a hydraulic power brake means having two separate sources for hydraulic pressure controlled by a valve to provide separate pressures to a vehicle's front and rear brakes that also is able to regulate a mechanical brake applicator for at least one of the front or rear brakes.

3,599,762

## WEDGE-ACTUATED THREE-SHOE BRAKE

Frank T. Cox, Jr., and Robert R. Svenson, both of Rochester, Mich., assignors to North American Rockwell Corporation, Pittsburgh, Pa.

Continuation-in-part of application Ser. No. 723,815, Apr. 24, 1968, now abandoned. This application Jan. 16, 1970, Ser. No. 3,420
Int. Cl. F16d 51/32
U.S. Cl. 188—323 6 Claims

A low radial profile drum brake mechanism including at least three brakeshoe assemblies and actuators positioned within a narrow annular space formed between the brakedrum and the drive mechanism of a heavy-duty vehicle. The actuators include wedges for forcing the adjacent brakeshoe assemblies apart and into engagement with the drum, the force input to the wedges being provided from a point outside of the narrow annular space.

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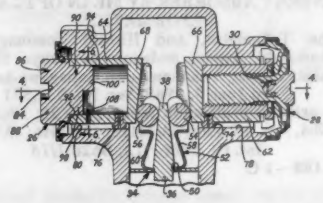
3,599,763

## ANCHOR PISTON FOR WEDGE BRAKE

Ronald D. Bailey, South Bend, Ind., assignor to The Bendix Corporation

Filed Jan. 26, 1970, Ser. No. 5,641
Int. Cl. F16d 51/18, 51/60
U.S. Cl. 188—326 5 Claims



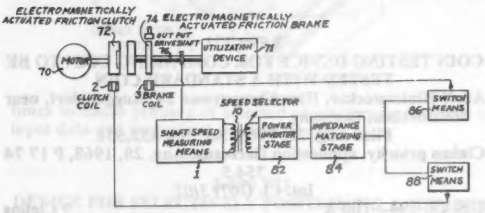
An anchor piston for a wedge brake includes a cylinder having a closed end engaging the wedge actuator and an opposite open end. An insert is slidably received in the cylinder and includes a portion projecting from the cylinder and having a slot formed therein which is adapted to receive one end of a brakeshoe. The portion of the insert which is disposed in the cylinder is provided with an axially extending surface having a pair of opposed end portions adjacent the wall of the cylinder. A pin projects from the wall of the cylinder and engages one of the opposed end portions to properly position the slot to receive the brakeshoe. By rotating the insert so that the pin engages the other one of the opposed end portions, the piston may be used in the brake mounted on the other side of the vehicle.

3,599,764

## SHAFT SPEED CONTROL SYSTEM COMPRISING CLUTCH AND BRAKE

Heinz Daab, Darmstadt, and Karl-Heinz Meier, Darmstadt im Fluerchen, both of, Germany, assignors to Quick-Rotan Becker & Notz KG, Darmstadt, Germany

Filed July 18, 1969, Ser. No. 842,992
Claims priority, application Germany, July 19, 1968, P 17 63 693.0
Int. Cl. F16d 67/06; H02k 27/20
U.S. Cl. 192—12 D 19 Claims




A control circuit for use in a motor drive utilizing selectively electromagnetically actuatable clutch and brake devices. The operating speed of a drive shaft of a utilization device is maintained at a preselected value by generating a rectified DC signal and superimposed AC signal when it falls below a reference value, indicating low shaft speed and causes energization of the clutch for increasing shaft speed. When the shaft speed becomes greater than selected, the generated signal exceeds the reference value and is detected by a second solid-state switch causing actuation of the brake until the shaft speed decreases. Alternating pulsewise nonoverlapping actuation of the clutch and brake devices maintains the utilization device drive shaft at the selected speed.

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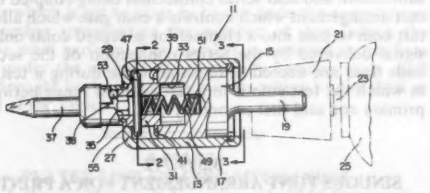
3,599,765

## SCREW DRIVER ATTACHMENT

Charles R. Turner, III, Littletown, Pa.; Raymond G. Bowers, Randallstown, Md.; Clyde R. Smith, New Freedom, Pa.; Paul C. Behrman, Jr., Kingsville, Md., and James A. Cummings, Baltimore, Md., assignors to The Black and Decker Manufacturing Company, Towson, Md.

Filed Sept. 30, 1969, Ser. No. 862,367
Int. Cl. F16d 43/20, 11/04
U.S. Cl. 192—56 R 5 Claims



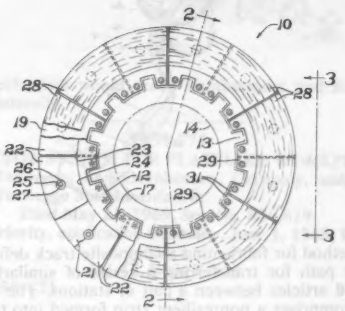
A device for attachment to a power tool having a rotary output, such as a drill, which device includes a housing having an input member adapted to be connected to said tool output. The device has an output member with a screwdriver bit attached thereto. This output member is normally disengaged from the input member but is connected thereto and driven thereby when the bit is pressed against a work member.

3,599,766

## SEGMENTED FRICTION MEMBER FOR BRAKE OR CLUTCH

William Edwin Ely, Troy, and Richard E. Frazier, Pleasant Hill, both of, Ohio, assignors to The B. F. Goodrich Company, New York, N.Y.

Filed Sept. 2, 1969, Ser. No. 854,536
Int. Cl. F16d 13/64
U.S. Cl. 192—107 R 3 Claims



A segmented friction member for a disc-type brake or clutch in which parallel spaced-apart segmented friction lining carriers are mounted on a unitary torque ring and hold segmented heat-absorbing material therebetween.

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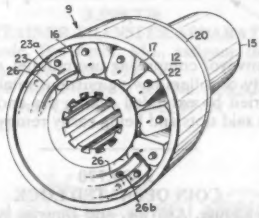
3,599,767

## REVERSIBLE SPRAG CLUTCH

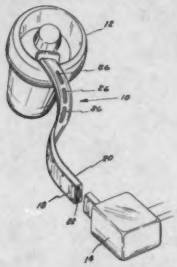
David N. Sederquist, 2727 Midtown Court #3, Palo Alto, Calif.

Filed May 28, 1970, Ser. No. 41,419
Int. Cl. F16d 41/08
U.S. Cl. 192—43.1 8 Claims



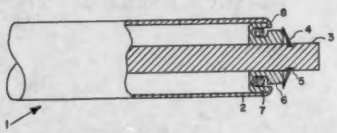
A reversible sprag clutch has a plurality of sprags disposed between spaced, opposed circular surfaces of two concentric members forming races for convex-convex contact wherein each of the sprags has two distinct inner cam surfaces, one of which inner cam surfaces can be employed to prevent relative clockwise rotation between the concentric members and the other of which inner cam surfaces can be employed to prevent counterclockwise rotation of the concentric members. These sprags are so constructed that the clutch transmitting torque in one direction will allow unrestricted rotation in the opposite direction depending upon which of the inner cam surface is cooperating with the inner race. Through the use of a selector ring to bias the individual sprags, it is possible to selectively reverse the direction of torque transmission to the clutch and allow "freewheeling" in the opposite direction.

3,599,768
**COMPOSITE TRACK AND METHOD OF MAKING SAME**
Patrick W. Connolly, Detroit, Mich., assignor to Visi-Trol Engineering Company, Detroit, Mich.
Filed Dec. 11, 1968, Ser. No. 782,917
Int. Cl. B65g *11/10*
U.S. Cl. 193—25 FT 8 Claims



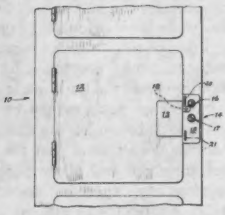
A method for fabricating a composite track defining an irregular path for transferring a series of similarly shaped, oriented articles between a pair of stations. The composite track comprises a nonresilient strip formed into the desired irregular path and retaining the shape of the irregular path, and a resilient, elongated and generally U-shaped member attached to the nonresilient strip thereby defining a channel between the nonresilient strip and the resilient member for guiding preoriented objects along the irregular path.

3,599,769
**ROLLER CONVEYOR**
Frederick J. Gardella, Salem, Mass., assignor to W. R. Grace & Co., Duncan, S.C.
Filed Sept. 6, 1968, Ser. No. 758,029
Int. Cl. B65g *13/00, 39/09*
U.S. Cl. 193—35 R 5 Claims



A roller conveyor comprising two parallel, slotted side rails and a plurality of rollers having pushnut retained bearing assemblies carried by extended shafts, the ends of said shafts being held in said slots and being easily removable therefrom.

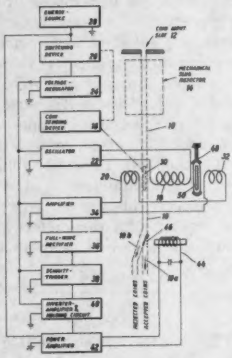
3,599,770
**COIN OPERATED LOCK**
Wells F. Stackhouse, Ashville, and Douglas A. Barth, Bemus Point, both of, N.Y., assignors to American Locker Company, Inc., Jamestown, N.Y.
Filed July 22, 1969, Ser. No. 843,299
Int. Cl. G07f *5/00*
U.S. Cl. 194—92 4 Claims



In a coin-operated lock unit of the type including a control or custodian key controlled lock and a coin-operated patron key lock, wherein the control lock is adapted to removably secure the unit to a cabinet in position adjacent a door thereof, and the patron lock is adapted to effect locking of the cabinet door, the improvement including control means operated externally of the lock unit for selectively converting the patron lock from coin operated to free status. The control means may include as an integral part thereof means to selectively release the patron key operated lock cylinder from the lock unit to facilitate replacement thereof without the necessity of removing the lock unit from the cabinet.

A further improvement includes novel means interconnecting a lock operation counter with a coin release mechanism via the patron lock, so as to accurately record each paid actuating cycle of the patron lock.

3,599,771
**COIN TESTING DEVICE FOR COMPARING COIN TO BE TESTED WITH A STANDARD COIN**
Adolf Hinterstocker, Hirschbergstrasse 28, Roggersdorf, near Holzkirchen, Germany
Filed Aug. 25, 1969, Ser. No. 852,531
Claims priority, application Germany, Aug. 28, 1968, P 17 74 754.5
Int. Cl. G07f *3/02*
U.S. Cl. 194—100 A 9 Claims

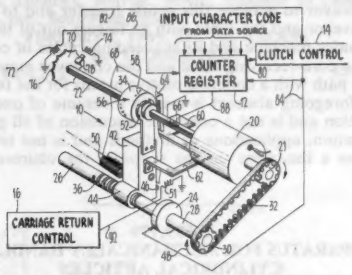


The genuineness of a coin is determined by comparison of the "test" coin with a "standard" coin which are interposed between a primary coil and first and second secondary coils respectively of a transformer, the primary coil being supplied with an AC signal while the secondary coils are connected in series so that the voltages induced by said primary coil are subtracted, and said series connection being coupled to a circuit arrangement which controls a coin gate which allows the test coin to pass into a channel for accepted coins only if the signal delivered by the series connection of the secondary coils does not exceed a threshold value during a test period in which the test coin is in a test position range between the primary and said first secondary coil.

3,599,772
**SINUOUS FONT ARRANGEMENT FOR A PRINTING MEANS**
George E. Comstock, Danville, Calif., assignor to The Singer Company
Filed Apr. 30, 1969, Ser. No. 820,408
Int. Cl. B41j *1/32*
U.S. Cl. 197—49 9 Claims

A font wheel having a plurality of character types arranged in a sinuous pattern is mounted for continuous rotation about its axis and for intermittent translation along its axis adjacent a sheet of paper on which selected characters are to be printed in a row along the axial direction of translation. A one-revolution selectively operated clutch connects a motive power source to a drive screw for intermittently translating the font wheel along its rotation axis. A print hammer

disposed behind the paper travels axially with the font wheel and is driven toward the paper and font wheel at selective




times to cause printing of selected characters in response to input data and font wheel position signals.

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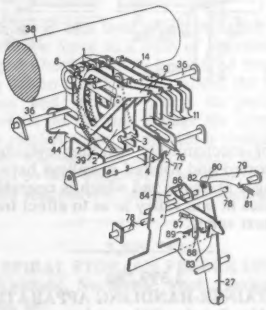
**3,599,773**

**DEVICE FOR SELECTIVELY POSITIONING A MEMBER IN A SERIES OF OPERATIVE POSITIONS**

**Francesco Serracchioli, and Nicolo Giolitti, both of Ivrea, Turin, Italy, assignors to Ing. C. Olivetti & C., S.p.A., Ivrea, (Turin), Italy**

**Filed Apr. 17, 1969, Ser. No. 817,117**
**Claims priority, application Italy, Apr. 23, 1968, 51396-A/68**
**Int. Cl. B41j *1/26***
**U.S. Cl. 197—55** **10 Claims**



In a mechanism, suitable for operating the type-carrier of a printing assembly, a device for selectively positioning a member positionable from an inoperative position to a series of operative positions in accordance with a combination code. The code combination corresponding to the operative position to be selected is temporarily stored in a binary pulse-counter which is set to store in binary code the complement of a number representing the number of steps which the member must perform. The member is actuated by resilient means under the control of a cyclically rotating main shaft and is brought back to its inoperative position by the shaft at the end of the cycle.

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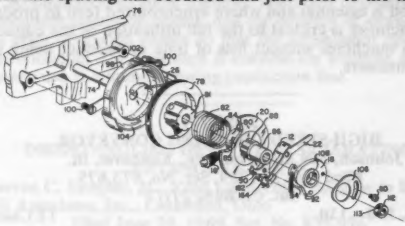
**3,599,774**

**PLATEN LINE-SPACING MECHANISM**

**Carl P. Anderson, Homer, N.Y., assignor to SCM Corporation**

**Continuation of application Ser. No. 669,032, Sept. 20, 1967, now abandoned. This application Nov. 10, 1969, Ser. No. 871,623**
**Int. Cl. B41j *19/76***
**U.S. Cl. 197—114** **2 Claims**

A mechanism for line spacing the platen of a business machine carriage in the rotational direction when in the left margin position without causing any movement of the carriage in the lateral direction. The mechanism includes a drum and cord arrangement which is momentarily clutched to the machine power supply for line spacing the platen through a crank device wherein the clutching time is controlled by a cyclic cam so as to disengage the clutch at a precise time just after line spacing has occurred and just prior to the time the



crank mechanism would reach its abutment and move the carriage laterally.

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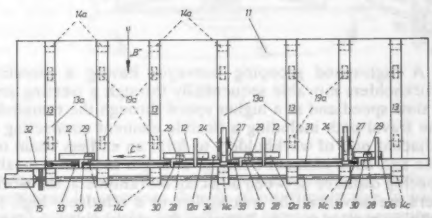
**3,599,775**

**CONVEYOR SYSTEM FOR PLATELIKE WORKPIECES**

**Helmut Torwegge, Bad Oeynhausen, Germany, assignor to Franz Torwegge Maschinenfabrik**

**Filed May 21, 1969, Ser. No. 826,619**
**Claims priority, application Germany, June 1, 1968, P 17 56 534.3**
**Int. Cl. B65g *47/42***
**U.S. Cl. 198—21** **7 Claims**



A conveyor system for platelike workpieces such as veneers, comprising a unilateral longitudinal conveyor located in the plane of movement of said workpieces, a plurality of transverse conveyors associated with said longitudinal conveyor, and means for controlling the longitudinal and transverse conveyor movements alternately, said means including a scanning device located in the vicinity of said longitudinal conveyor.

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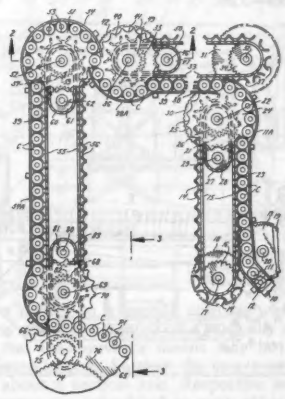
**3,599,776**

**CONTAINER TRANSFER APPARATUS**

**Momir Babunovic, Des Peres, Mo., assignor to Barry-Wehmiller Company, St. Louis, Mo.**

**Filed May 21, 1969, Ser. No. 826,520**
**Int. Cl. B65g *47/32, 47/84***
**U.S. Cl. 198—25** **6 Claims**



Apparatus for transferring containers between conveyor runs and for feeding production machines such as container

fillers in which the transfer apparatus is adapted to move containers at high speed around corners, where a change of direction is essential and where synchronized feed to production machines is critical to the full utilization of the capacity of such machines without loss of time or product being put into containers.

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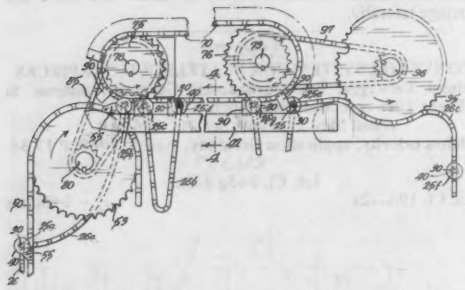
**3,599,777**
**HIGH-SPEED GROUPING CONVEYOR**
**Fred I. Johnson, 369 Montrose Ave., Elmhurst, Ill.**
**Filed Nov. 4, 1969, Ser. No. 873,879**
**Int. Cl. B65g** *21/12*
**U.S. Cl. 198—110** **12 Claims**



A high-speed grouping conveyor having a plurality of workholders movable sequentially through a treating area at a slow speed and at a higher speed through the remainder of the travel path including a flexible element connecting each adjacent pair of workholders to form an endless chain or the like and each element being of a length to form a maximum spacing distance between adjacent workholders, the workholders are advanced by mechanism at a relatively high speed with maximum spacing between the workholders in the portions of the travel path outside the treating area and drive means within the treating area engage each of the workholders to maintain uniform spacing therebetween at a lesser distance apart to provide grouping in the treating area as permitted by the flexible element connecting the workholders and with advance of the workholders at the slow speed for the desired treatment interval.

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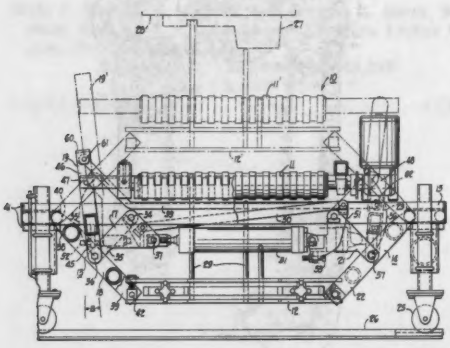
**3,599,778**
**CORE RECEIVER ASSEMBLY**
**Hugh A. Bourassa, University Heights; Arthur H. Emser, Mentor, and Edward J. Ptak, Cleveland, all of, Ohio, assignors to Acme-Cleveland Corporation**
**Division of Ser. No. 735,867, June 10, 1968, Pat. No. 3,540,608.**
**Filed Nov. 21, 1969, Ser. No. 877,559**
**Int. Cl. B65g** *41/00*
**U.S. Cl. 198—126** **9 Claims**



The disclosure relates to an assembly to receive a core or mold from a foundry machine and to move it gently onto a conveyor. The core may be dropped by gravity onto a series of fingers held in a core-receiving table and then this table drops downwardly to gently place the core on a ribbon-type conveyor. The table moves downwardly about twice as far as the conveyor to achieve this gentle transfer and to get both the conveyor and the table with its fingers out of the way of the foundry machine and its succeeding cycles of operation. Both the core-receiving table and the conveyor move along a vertical path with a common motive means for the two.

The foregoing abstract is merely a resume of one general application and is not a complete discussion of all principles of operation, applications or methods and is not to be construed as a limitation on the scope of the claimed subject matter.

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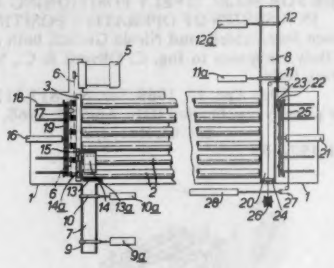
**3,599,779**
**APPARATUS FOR MECHANICALLY HANDLING CYLINDRICAL ARTICLES**
**Peter F. Coe, Bedford, England, assignor to Lever Brothers Company, New York, N.Y.**
**Filed May 29, 1969, Ser. No. 828,924**
**Int. Cl. B65g** *13/071*
**U.S. Cl. 198—127** **1 Claim**



Apparatus for mechanically handling cylindrical articles which are supported and rotated in valleys between a series of rotors, having a pressure pad which is operable to engage cylindrical articles in one valley to as to effect transfer of the articles to the next valley.

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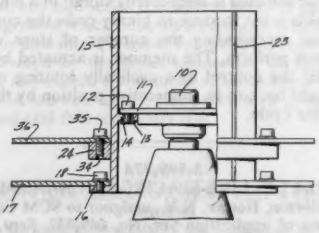
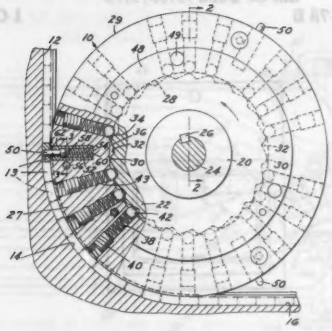
**3,599,780**
**CONTAINER-HANDLING APPARATUS**
**Thomas B. Sorbie, Toledo, Ohio, assignor to Owens-Illinois, Inc.**
**Filed Jan. 30, 1970, Ser. No. 7,136**
**Int. Cl. B65g** *29/00*
**U.S. Cl. 198—209** **10 Claims**



Indexing mechanism for multiple-station, glassware inspection machines in which two or more pocketed star wheels are used. The mounting of the plural star wheels, which are selected as to size of pockets depending on the height and width of the ware being inspected, is simplified by the use of a universal hub to which the lower star wheel is fixed. Additional star wheels are mounted on the hub at adjustable heights by the use of split, clamping rings that are keyed to the hub to maintain vertical orientation of the pockets of all star wheels.

3,599,781
**FEED WHEEL FOR FEEDING INTERMITTENTLY MOVABLE PARTS**
Claude R. Hoadley, Detroit, Mich., assignor to Feedmatic-Detroit, Inc., Southfield, Mich.
Filed July 2, 1969, Ser. No. 838,436
Int. Cl. B65g 29/00
U.S. Cl. 198—212 10 Claims



The disclosure is of a feed wheel assembly for applying a continuous motive force to a train of intermittently movable parts. The feed wheel assembly has a feed ring mounted on a continuously driven clutch ratchet wheel, the latter having alternate crests and recesses along its periphery. Spring-pressed followers on the ring engage the crests and recesses of the clutch ratchet wheel to provide a yieldable drive to the feed ring. The followers are spaced apart different distances than the crests so that when the drive slips, the followers pass over the crests successively rather than simultaneously.

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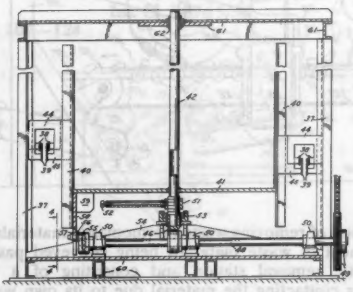
3,599,782
**SPIRAL STORAGE FEEDER UNIT**
Homer G. Whitfield, Northville, Mich., assignor to Condeco Automation, Inc.
Filed Nov. 15, 1968, Ser. No. 776,154
Int. Cl. B65g 25/04
U.S. Cl. 198—219 17 Claims



The invention pertains to a spiral storage feeder unit primarily intended to receive parts from a prior manufacturing operation and pass them to a subsequent operation. The invention provides for pass through during normal operation; for accumulation to allow the prior operation to continue if a subsequent operation ceases; and for delivery of stored parts if a prior operation ceases so that the subsequent operation may continue. The invention is suitable for multiple and automatic use in a manufacturing production line.

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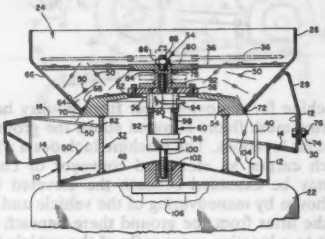
3,599,783
**DISENTANGLING DEVICE FOR SEPARATING ENTANGLED PARTS**
Warren C. Burgess, Jr., Avon Lake, Ohio, assignor to Burgess & Associates, Inc., Lakewood, Ohio
Filed June 20, 1969, Ser. No. 835,096
Int. Cl. B65g 27/16, 47/24
U.S. Cl. 198—220 30 Claims



There is provided a support for an entangled mass of parts characterized by openings therein of insufficient size to pass a tangled mass of parts, but sufficient to pass parts separated therefrom, and means for vibrating the support.

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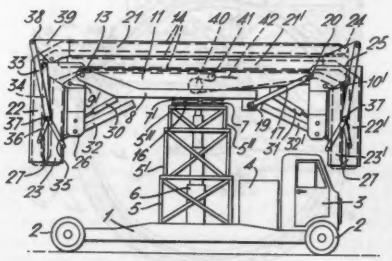
3,599,784
**AUTOMOTIVE CONTINUOUS CONVEYOR OF AN ARTICULATED TYPE**
Lionello Rossi, Via Tiburtina, Km. 16,500, Rome, Italy
Filed Dec. 10, 1969, Ser. No. 883,796
Claims priority, application Italy, Dec. 16, 1968, 42000/68
Int. Cl. B65g 21/12, 41/00
U.S. Cl. 198—233 5 Claims

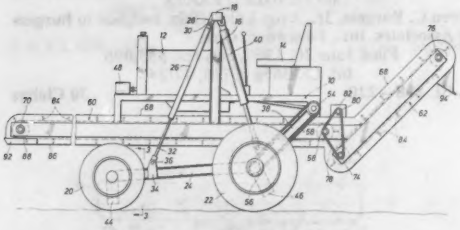


The invention relates to a mobile conveyor wherein an endless conveyor means is mounted on a vertically telescopic framework so that the conveyor means may be raised or lowered to different heights. Further, the conveyor means is itself rotatable about a vertical axis. Respective sections of the conveyor means are articulated to each other whereby they may assume a mutually coplanar orientation when in use, or a compact folded orientation when being transported.

## 3,599,785
## MACHINE FOR REMOVING LITTER FROM POULTRY HOUSES

Jack S. Stuart, Rt. 3, Nashville, Ark., and Jerry D. Pennington, Rt. 2, Murfeesboro, Ark.

Filed July 17, 1969, Ser. No. 842,643
Int. Cl. B65g 41/00
U.S. Cl. 198—233 1 Claim

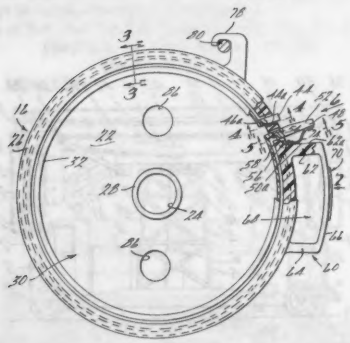


A machine for removing litter from poultry houses of the type having mesh floors elevated above the ground level and from similar locations. The machine includes a wheeled vehicle which carries an elongated conveyor or chute or duct which may be extended beneath the elevated floor of the poultry house by maneuvering of the vehicle and operated to collect the litter from the ground there beneath and convey the same to a location rearwardly of the vehicle for disposal. The vehicle has front and rear wheels mounted for vertical adjustment by pressure fluid mechanism to elevate and lower the conveyor chute and which may also be adjusted to regulate the angular position of the chute relative to the horizontal independently of the elevation of the chute to enable the machine to be used on sloping ground while maintaining the chute with its forward end positioned to be extended into the poultry house at a location to collect litter therefrom.

## 3,599,786
## TAPE CANNISTER

Boris M. Osojnak, Birmingham, Mich., assignor to Engineered Data Products, Inc., Ferndale, Mich.

Continuation of application Ser. No. 768,023, Oct. 16, 1968, now abandoned. This application Jan. 12, 1970, Ser. No. 2,446
Int. Cl. B65d 45/02, 85/67
U.S. Cl. 206—52 23 Claims

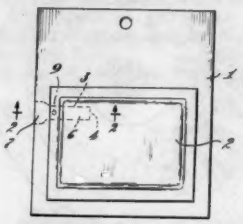


A canister for storing a tape reel, comprising a base or shell member of generally cup-shaped configuration and a split sealing ring positioned on the inner periphery of the rim portion of the shell member and having a handle portion at one end projecting outwardly through the rim portion for manipulation by an operator so that the ring may be expanded to allow passage of the flange of a tape reel and thereafter contracted to trap the reel within the canister In an alternate form, the sealing ring is replaced by a strip of flexible material positioned around the inner periphery of the shell rim portion and carrying a flocking of resilient bristles which deflect to allow insertion of the reel and thereafter coact with the outer reel flange to seal the reel within the canister.

## 3,599,787
## BLISTER PACKAGE

Walter C. Webster, Jr., Northboro, Mass., assignor to Dennison Manufacturing Company, Framingham, Mass.

Filed Nov. 4, 1969, Ser. No. 873,849
Int. Cl. B65d 73/00, 5/70
U.S. Cl. 206—78 B 1 Claim

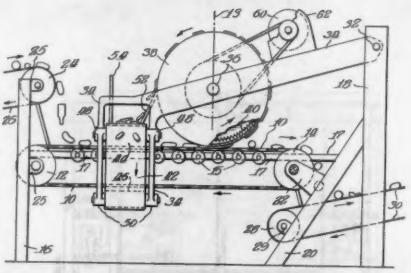


A package comprising a back and a blister adhered thereto around its periphery, the back having a margin extending beyond the blister and a tab formed in the back by weakened lines, the tab extending to the edge of said margin and being integrally connected to the backing along a hinge line inside said periphery so as to swing downwardly when the weakened lines are broken thereby to form an opening in the back, the tab flaring outwardly from a location outside said periphery so as to hold the opening closed when the flaring portion is bent upwardly at said location.

## 3,599,788
## METHOD OF WASTE THERMOPLASTIC REMOVAL

Robert D. Fyfe, Wheaton, and Victor Brown, Elmhurst, both of, Ill., assignors to Metropolitan Waste Conversion Corporation, Wheaton, Ill.

Filed Oct. 4, 1968, Ser. No. 765,247
Int. Cl. B07b 13/00
U.S. Cl. 209—11 3 Claims



Method of removing waste thermoplastic materials from an assortment of waste materials being conveyed past a thermoplastic removal station and consisting of a rotatable cylinder contacting the material due to its own weight and either driven by the movement of the conveying means or in synchronism therewith from an independent power source. The cylinder has a surface of contact with the materials, and means is provided to heat it to a temperature which softens the thermoplastic materials to a sufficient extent that they adhere to the heated surface and are carried away from the conveying means. To remove the softened and adhered ther-

moplastic materials from the cylinder, a scraper is provided contacting its surface and is effective to scrape the thermoplastic materials from the cylinder whereupon it may be carried away by a conveyor or the like.

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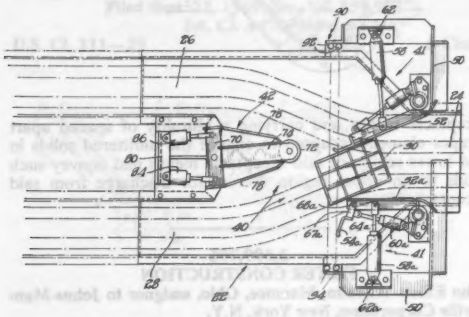
**3,599,789**

**HIGH-SPEED CASE-SORTING APPARATUS**

**Walter J. Kurczak, Chicago, Ill., assignor to Mojonnier Bros. Co., Chicago, Ill.**

**Filed Aug. 5, 1969, Ser. No. 847,580**
**Int. Cl. B07c** *3/02*
**U.S. Cl. 209—74** **15 Claims**



Apparatus for the automatic sorting of stacks of cases being transported by a conveyor system having a junction including two or more outlet branches. The stacks to be sorted are of two varieties, in that they contain either full or empty cases. The apparatus includes diverting means positioned proximate the juncture of the respective conveyor branches, and operable to direct cases entering the junction to a selected one of the outlet branches depending on the type of cases in the stack. Direction of the stacks to the outlet branches is achieved by a sensing arrangement which functions in conjunction with various control elements for the diverting means. The sensing arrangement produces a control signal dependent upon the nature of the stack entering the conveyor junction, which signal is operable through the various control elements to effect indexing of the diverting means to the position for directing the stacks to the proper conveyor outlet branch.

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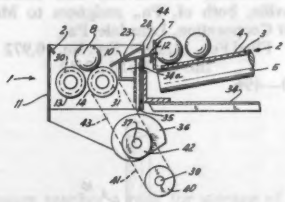
**3,599,790**

**APPARATUS FOR THE SELECTION OF FRUITS**

**Mariano G. Morey, Valencia, Spain, assignor to Manufacturas De Precision, S.A., Valencia, Spain**

**Filed Dec. 22, 1969, Ser. No. 887,148**
**Int. Cl. B07c** *5/36*
**U.S. Cl. 209—124** **12 Claims**



An open-topped elongated housing comprises an inlet for intermittently admitting articles of fruit from an endless belt onto two adjacent equidirectionally rotating roller members extending longitudinally in the housing. One of the roller members comprises a helical endless channel which accommodates the articles of fruit and, in association with the second roller member, rotates the former for visual inspection and grading and, simultaneously, conveys the same to an outlet of the housing where the articles are sorted according to size.

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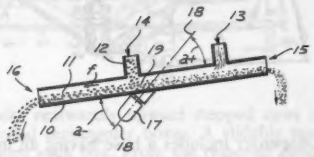
**3,599,791**

**HYDRAULIC SORTING APPARATUS**

**Elie Condolios, Grenoble, France, assignor to Societe Grenobloise d'Etudes et d'Applications, Grenoble, France**

**Filed Dec. 26, 1968, Ser. No. 787,088**
**Claims priority, application France, Dec. 28, 1967, 5207**
**Int. Cl. B03b** *3/12*
**U.S. Cl. 209—157** **5 Claims**



The particulate-sorting apparatus herein comprises a flume sloping at a shallow angle and containing a free-surface flow of liquid at a given rate and being provided with means for generating vibratory motion on the flume along an axis at an acute angle to the flow and contained in a vertical plane passing through the flow axis.

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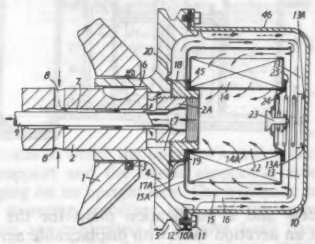
**3,599,792**

**CENTRIFUGAL FILTER ASSEMBLY WITH RELIEF VALVE**

**Peter William Stripp, Crownhill, Plymouth, Devon, England, assignor to Tecalemit (Engineering) Limited, Plymouth, Devon, England**

**Filed May 24, 1968, Ser. No. 731,935**
**Claims priority, application Great Britain, June 5, 1967, 25,854/67**
**Int. Cl. B01d** *35/02*
**U.S. Cl. 210—130** **11 Claims**



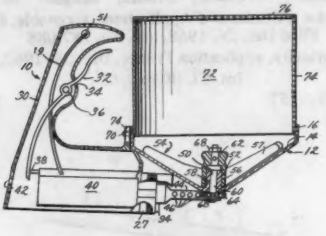
An improved fluid filter in which the casing is rotatable so that the filtering action is improved due to the rotational forces acting on the contaminant particles in the fluid. The rotational forces also remove contaminant on the filter element so as to effect a cleaning action on the element and give more efficient filtering. Preferably, the lubricant flow is directed past the contaminant retaining portion so that a primary coarse filtering action is obtained before the lubricant passes to the filter element.

**3,599,793**

## DISPENSER FOR CHOPPED VEGETABLES HAVING ROTARY BLADE AGITATOR

**Anthony J. Arbini, Novato, Calif., assignor to McCormick & Company, Inc., Cockeysville, Md.**

**Filed Mar. 27, 1970, Ser. No. 23,427**
**Int. Cl. C02c *1/00***
**U.S. Cl. 210—152** **9 Claims**



The dispenser includes a base having an inclined bottom wall provided with at least one array of vaned slots circumscribed by a chute, the base further includes a handle provided with a pistol grip which encloses an air motor whose reciprocating element drives a blade unit disposed on the upper surface of the bottom wall. A canister mounted on the base supplies batches of chopped succulent vegetable material, such as reconstituted chopped onions, to the base. The device is especially useful, when provided with a plurality of dispensing chutes, for accurately and rapidly applying controlled amount of chopped, succulent vegetable material to portion controlled meals in meal preparation assembly lines at limited menu, fast service restaurants.

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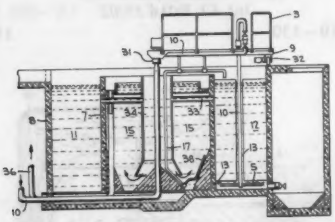
**3,599,794**

## PURIFICATION PLANT FOR AERATION OF SEWAGE

**August Schreiber, Bahnhofstrasse 45 A, Vinnhorst, and Martin Danjes, Hermannstrasse 3, Denmold, both of, Germany**

**Filed Aug. 11, 1969, Ser. No. 849,098**
**Claims priority, application Germany, Aug. 12, 1968, P 17 84 469.8**
**Int. Cl. C02c *1/12***
**U.S. Cl. 210—195** **8 Claims**



A process and a purification plant for the aeration of sewage in an aeration tank with displaceable aeration means arranged close to the bottom of the tank.

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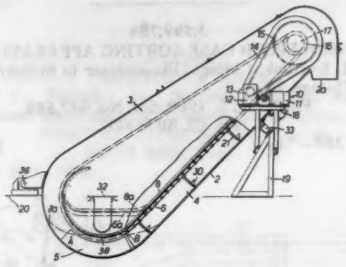
**3,599,795**

## APPARATUS FOR SEPARATING SOLIDS FROM LIQUIDS

**Ronald Frederick Worlidge, "High Ridge," 9 Durlston Road, Parkstone, Poole, Dorset, England**

**Filed Jan. 29, 1970, Ser. No. 6,759**
**Claims priority, application Great Britain, Jan. 30, 1969, 5,129/69**
**Int. Cl. B01d *35/16***
**U.S. Cl. 210—413** **11 Claims**

A filtration apparatus comprising a receptacle means into which liquid containing solids may be passed, drainage apertures in a lower region of said receptacle means to permit the passage therethrough under gravity of the liquid and such solids as are capable of filtering through said drainage apertures, and an endless conveyor means operable within said



receptacle means and carrying a plurality of spaced apart scraper elements adapted to engage the unfiltered solids in said lower region of said receptacle means and convey such solids to an upper region thereof for discharge from said receptacle means.

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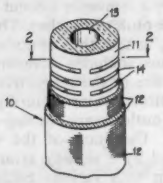
**3,599,796**

## FILTER CONSTRUCTION

**John Elliott Wilhelm, Maumee, Ohio, assignor to Johns-Manville Corporation, New York, N.Y.**

**Filed June 6, 1969, Ser. No. 831,147**
**Int. Cl. B01d *29/26***
**U.S. Cl. 210—457** **10 Claims**



A composite filter construction adapted for filtering flow directed from the interior of the filter body outwardly therethrough towards the exterior thereof, comprising an outer section of filtering fluid permeable mass surrounding an inner section also of filtering fluid permeable mass with said inner section having an internal fluid distributing channel therein and a multiplicity of openings passing through its mass extending and increasing in area from the internal fluid distributing channel to the surrounding outer filtering section for secondary fluid distribution.

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**3,599,797**

## FILTER AND METHOD OF MAKING SAME

**Henry M. Mikulski, Churchville, and Harold F. Bixler, Schwenksville, both of, Pa., assignors to Met-Pro Water Treatment Corporation, Lansdale, Pa.**

**Filed Feb. 12, 1970, Ser. No. 10,972**
**Int. Cl. B01d *29/32***
**U.S. Cl. 210—496** **7 Claims**

A filter mass is comprised of fibers coated with a polymer. The polymer coatings are bonded to each other. The fibers

lie in approximately parallel planes with the net angle of the fibers being zero with respect to the direction of flow. The fibers are generally parallel to the direction of flow. The method includes compacting or pressurizing the polymer encapsulated coated fibers in a direction generally perpendicular to the intended direction of flow and then heating the thusly pressurized fibers by steam generated in a vessel. Selective control of porosity in different portions of the filter may be attained by varying the amount of pressure applied to the portions of the filter mass.

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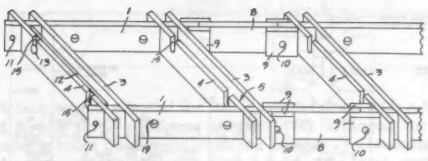
**3,599,798**

**BICYCLE RACK**

**George M. Osborn, 275 Center St., San Rafael, Calif.**

**Filed Sept. 22, 1969, Ser. No. 859,981**
**Int. Cl. A47f 7/00**
**U.S. Cl. 211—20** **5 Claims**



A pair of parallel base boards, at least two sets of parallel cross boards interlocked with the base boards at about 45° included angle with the base boards; the parallel cross boards in each set being spaced apart to form a space to hold a bicycle wheel; the base boards being spaced apart to form the ends of said space and also obstructions or risers for the bicycle wheel, and to hold several bicycles longitudinally staggered thereby preventing abutting of the handle bars of any bicycle with the handle bars or seats of adjacent bicycles parked in the rack, means being provided to interlock several racks in longitudinal series. Each rack unit is invertible to slant in either direction.

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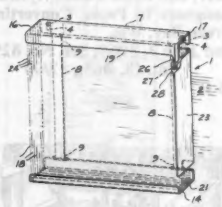
**3,599,799**

**RACK FOR PHONOGRAPH ALBUMS**

**Hans Herrli, Beilvueweg 15, Bellmund 3271, and Peter Herrli, Neumattstrasse 19, Port 6, Bienne/BE, both of, Switzerland**

**Filed Oct. 4, 1968, Ser. No. 765,244**
**Int. Cl. A47b 81/06**
**U.S. Cl. 211—40** **2 Claims**



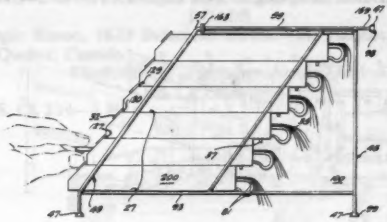
This disclosure teaches a rack for storage of phonograph records in jackets, which jackets can be mounted conveniently on a wall or like vertical surface for display. A lower channel projects outward from the wall and receives edge-mounted record jackets therein. A hinged upper channel retains the record jackets in the lower channel. To keep records from rolling out of their jackets a side member is provided. The upper channel can be connected hingedly by means of a reduced section and a clasp serves to retain the upper channel in its closed position.

**3,599,800**

**STATION AND METHOD TO STORE AND DISPENSE WIRING COMPONENTS**

**Bernard J. Durante, Playa Del Rey, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.**

**Filed Dec. 9, 1968, Ser. No. 782,145**
**Int. Cl. A47f 3/14, 7/00**
**U.S. Cl. 211—128** **10 Claims**



A rack stacks rearwardly upward stepped rows of elongated open-ended rectangular boxes. A slidably removable divider partitions each box. From the removed divider rear along its undersurface, then around a front groove and then rearwardly over the divider is drawn a group of prepared wires. The loaded divider is inserted in the box for assembly of wires into equipment. One embodiment divider is rearwardly looped downwards to support one dangling end of long wires. The box row stepping enables separation of rows of overhanging wires into different planes. Another divider embodiment for shorter wires terminates with a box rear closure.

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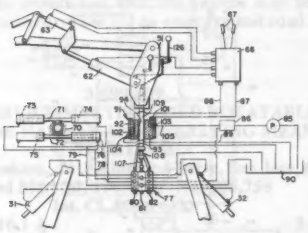
**3,599,801**

**CONTROLS FOR HYDRAULICALLY OPERATED ROTARY CRANE**

**John MacDougal Roll, Fonthill, and William Roderick MacGregor, Welland, Ontario, both of, Canada, assignors to Deere & Company, Moline, Ill.**

**Filed Aug. 19, 1969, Ser. No. 851,259**
**Int. Cl. B66c 23/54**
**U.S. Cl. 212—35** **12 Claims**



A rotary crane in which the operator's station is carried on the boom support and the boom support is mounted for lateral swinging on an upright axis. The hydraulic motors for raising and lowering stabilizer legs and for swiveling the boom support are controlled by a valve bank fixed against rotation. Control rods for the valve bank are carried on the swivel axis of the boom support and have their upper ends connected to control levers at the operator's station and their lower ends connected to the valve bank.

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**3,599,802**

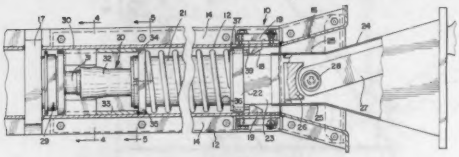
**CUSHIONING ARRANGEMENT FOR RAILWAY CAR**

**Willis H. Knipple, Palos Park, Ill., assignor to Pullman Incorporated, Chicago, Ill.**

**Filed Dec. 8, 1969, Ser. No. 882,941**
**Int. Cl. B61g 9/12, 11/12**
**U.S. Cl. 213—8** **5 Claims**

A railway car underframe is provided at opposite ends thereof with end-of-car cushions which are disposed in a

cushion pocket. Each end-of-car cushion includes a piston which is rigidly connected against longitudinal movement within the pocket and is provided with a cylinder having at its other end a connector plate engageable with stops provided at the forward end of the cushion pocket. The connector plate is also provided with a yoke having a coupler shank pivotally connected thereto and the yoke in turn is connected to a bellmouth housing to reciprocate relative to the end of the underframe. A spring is held captive between the end



connector plate and a sliding collar encircling the cylinder. The end connector is provided with upper and lower pairs of bores within which slidable thrust elements are provided which normally are in engagement with the forward stops. During a draft impact the connector plate moves into engagement with the stops and upon cessation of the draft impact the connector plate is restored to its neutral position by the force of the coil spring which is in engagement with the thrust elements.

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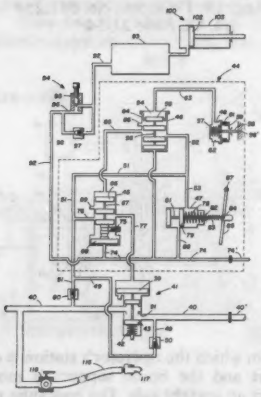
**3,599,803**

**AUTOMATIC PNEUMATIC COUPLING SYSTEM**

**Geoffrey Wilton Cope, Williamsville, N.Y., assignor to Dresser Industries, Inc., Dallas, Tex.**

**Filed Oct. 2, 1969, Ser. No. 863,262**
**Int. Cl. B61g 5/08**
**U.S. Cl. 213—76** **14 Claims**



An improvement in an automatic coupling system for a railway car which is equipped with a mechanical knuckle-type coupler, a main air line adapted to be connected to a corresponding air line of another railway car, a main valve interposed in the main air line, and means for actuating the main valve responsive to intentional uncoupling of the railway car. The improvement, in its preferred form, takes the form of an extensible pneumatic piston and cylinder assembly, one part of which is attached to the main body of mechanical coupler and the other part of which is operably connected to the operating mechanism of the coupler for opening of the knuckle of the coupler. The piston and cylinder assembly is operatively associated with the means for actuating the main valve so that upon actuation of the main valve during intentional uncoupling of the railway car, air will be admitted to the piston and cylinder assembly. Upon separation of the railway cars, air is bled from the system allowing piston and cylinder assembly to retract leaving the coupler open and ready for coupling. The bleeding of the cylinder and piston assembly is preferably effected through a pneumatic time delay circuit to assure that the assembly has been fully extended upon uncoupling of the railway car before operating pressure is lost in the cylinder and ram assembly.

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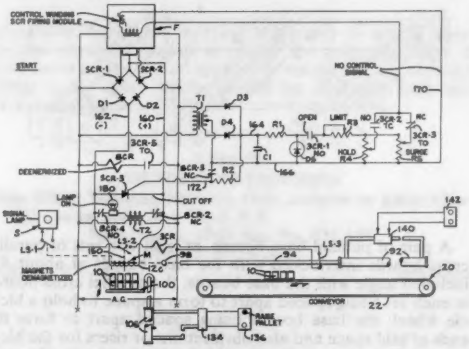
**3,599,804**

**MAGNETIC CAN HANDLING APPARATUS WITH SURGE AND HOLD CONTROL**

**Peter L. Chorney, Hoopeston, Ill., assignor to FMC Corporation, San Jose, Calif.**

**Filed July 28, 1969, Ser. No. 845,371**
**Int. Cl. B66c 1/04**
**U.S. Cl. 214—1 BT** **5 Claims**



Apparatus for transferring patterns of cans from a pallet to a conveyor includes a carriage having can lifting electromagnets. The magnets are powered from a silicon controlled rectifier bridge and successive control signals are sent to the bridge upon magnet energization. First a relatively high current "surge" signal is provided for initially gripping the cans, after which a timer relay circuit replaces the surge signal with a lower current "hold" signal.

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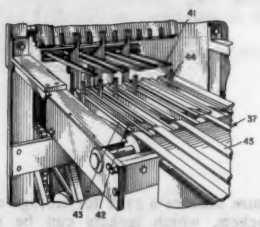
**3,599,805**

**UNIT-HANDLING APPARATUS**

**Harvey J. Spencer, and Ernst Daniel Nystrand, both of Green Bay, Wis., assignors to Paper Converting Machine Company, Inc., Green Bay, Wis.**

**Filed June 3, 1969, Ser. No. 829,873**
**Int. Cl. B65g 57/00**
**U.S. Cl. 214—6 H** **2 Claims**



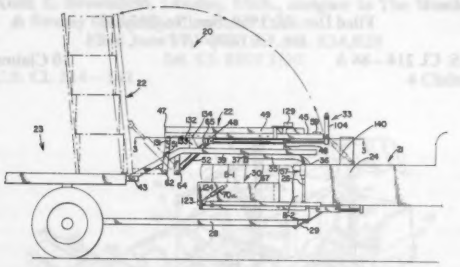
Unit-handling apparatus for "unit sets" which are multiple-web packets useful in computer technology wherein separator fingers, elevator fingers and pushers all cooperate in assembling the unit sets into precise stacks both dimensionally and as to number.

**3,599,806**

## BALE WAGON

Raymond C. Fischer, Hinsdale, Ill., assignor to International Harvester Company, Chicago, Ill.

Division of Ser. No. 710,284, Mar. 4, 1968, Pat. No. 3,528,564.
Filed Dec. 4, 1969, Ser. No. 882,728
Int. Cl. B65g 57/32
U.S. Cl. 214—6 B 8 Claims



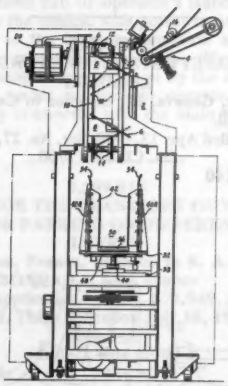
A bale wagon adapted for use in combination with a baler and having three platforms cooperatively arranged for (1) receiving bales discharged from the baler, (2) accumulating and rearranging the bales to form a horizontal layer, and (3) accumulating a series of layers to form a load of bales. The bale wagon includes a bale pusher assembly which may be selectively actuated to form a layer having bales arranged in an interlocked relation with bales of an adjacent layer.

**3,599,807**

## ARTICLE COUNTER-STACKER HAVING MECHANICALLY OPERATED GATES ON THE STACK-RECEIVING TABLE

Robert R. Hedrick, Brookfield, and Robert W. Wischer, Delafield, both of, Wis., assignors to Cutler-Hammer, Inc., Milwaukee, Wis.

Filed Feb. 2, 1970, Ser. No. 7,642
Int. Cl. B65g 57/06
U.S. Cl. 214—6.5 4 Claims



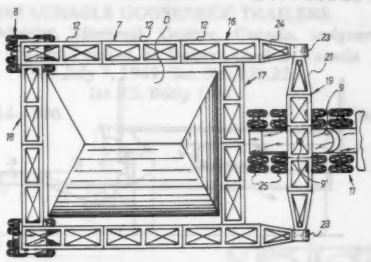
A plurality of aligned pairs of stacking blades are indexed downward past the output end of a lapped stream newspaper conveyor. The blades are pivotally mounted to respective sets of link chains and spring biased to a normal position. A latch member interferes with a pair of blades just above the input conveyor to restrain those blades against the spring bias and releases them coincident with the beginning of an indexing cycle to cleanly intercept the stream and index those blades to a stacking position. A subsequent indexing cycle moves those blades apart to drop the stack to a table which may be indexed in one-half revolution intervals to permit a second stack to be dropped upon the first, forming a double batch stack with the folded edges on opposite sides. The table has high side walls and mechanically operated gates closing off the ends between the sidewalls to restrain the stack on the table during indexing. A gate actuating mechanism on the frame of the machine is spring biased to normally engage the gate linkage to cause the gates to be opened, but the mechanism is held retracted at all times except during the operation of a pusher mechanism which travels over the table to eject the stack.

**3,599,808**

## MOVING APPARATUS FOR BUILDINGS AND OTHER LOADS

Roger Bisson, 1825 Delorimer Street, Ville Jacques, Cartier, Quebec, Canada

Filed Mar. 17, 1969, Ser. No. 807,661
Int. Cl. B65g 67/02
U.S. Cl. 214—1 H 17 Claims



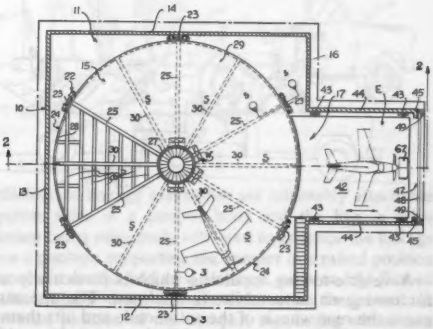
An apparatus for moving buildings such as houses and the like heavy loads of various shapes and sizes, comprising a frame made of a plurality of rigidly interconnectable modular frame sections, to form a frame surrounding a house, power-driven and power-steered wheel assemblies supporting said frame above ground and power-operated load-lifting means mounted on said frame to lift the house for its transport by the wheeled frame, and frame-lifting means to lift the frame in order to rotate the wheels, the system so arranged that the frame can be modified in accordance with the shape and size of the load to be transported in order to closely surround the same, and also the load-lifting means can be operated from a remote point in a controlled manner so as to lift the house uniformly and wherein the vehicle can be displaced in any direction so that the house may be lowered in the exact spot and at the right orientation; also, the vehicle may be disassembled and made narrower for an empty to suit road regulations.

**3,599,809**

## SELF SERVICE MULTISTORIED ROTATABLE AIRPLANE HANGAR AND OPERATING MEANS THEREFOR

Conrad W. Gresham, 4919 Elmwood Drive, San Jose, Calif.

Filed Mar. 20, 1969, Ser. No. 808,759
Int. Cl. E04h 6/06
U.S. Cl. 214—16.1 A 3 Claims



Independently rotatable storage platforms sectored into numbered spaces and having their peripheries arranged for

contiguous disposition adjacent an elevator platformed and controlled for operation by an indexer operable upon insertion of a coded card to position a particular storage space for receipt or discharge of an airplane and the like from or to such elevator.

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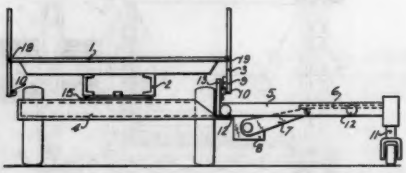
**3,599,810**
**LOAD-CARRYING VEHICLE**

Heinrich Wanko, Pingsheim, Germany, assignor to Rationorm AG, Zug, Switzerland

Filed Dec. 17, 1969, Ser. No. 885,729
Claims priority, application Germany, Dec. 18, 1968, P 18 15 357.6
Int. Cl. B60p 1/44
U.S. Cl. 214—77 R 15 Claims



A load-carrying vehicle has a load-carrying bed opposite sides of which extend lengthwise of the vehicle. At least one support rail extends along one of the sides at the underside of the bed at least when in use. A supporting frame is mounted on the bed below the same and has an open side. Loading platform means is provided including a slidable frame mounted in the supporting frame for movement relative to the same between an extended and a withdrawn position in the first of which it respectively is withdrawn from the supporting frame through the open side thereof and extends at least in part laterally beyond the one side, and in the second of which it is withdrawn in its entirety inwardly of said one side. Connecting means connects the slidable frame with the support rail for movement lengthwise of the same when the slidable frame is in the extended position. Ground support means supports the part of the slidable frame which extends beyond said one side, on the ground when the slidable frame is in the extended position.

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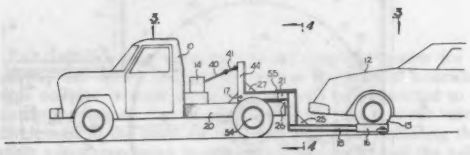
**3,599,811**
**VEHICLE-TOWING APPARATUS**

Wilson F. Watkins, 7263 Oakdale Ave., Canoga Park, Calif.

Filed June 26, 1969, Ser. No. 836,745
Int. Cl. B60p 3/12
U.S. Cl. 214—86 A 5 Claims



A vehicle-towing apparatus which is particularly suitable for towing an automobile, is disclosed. The apparatus engages the rear wheels of the automobile and lifts them above the ground when the automobile is towed. No cabling or hooks are coupled to the automobile when it is being towed. The apparatus is adaptable for towing a vehicle without entering the vehicle and thus may be used for towing locked vehicles.

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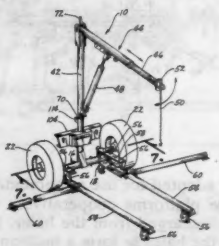
**3,599,812**
**CRANE AND TOW UNIT**

Roger D. Hasstedt, 4041 Hubbell Blvd., Des Moines, Iowa, and Kenneth L. Hasstedt, 723 Washington, Des Moines, Iowa

Filed Dec. 15, 1969, Ser. No. 885,015
Int. Cl. B60p 3/12
U.S. Cl. 214—86 A 10 Claims



A unit in one position on caster wheels for use as a crane for lifting engines while in another position of operation being carried on a second set of wheels only for transport or towing other vehicles. The boom is extendable, pivotal and rotatable and when the unit is used as a towing device it will lift a towed vehicle through a cable arrangement on the opposite side from the boom while the boom is being raised. When the unit is in a crane position a pair of outwardly extending members having casters thereon extend below the boom and stabilize the unit while these same members in the towing position are interconnected by a hitch assembly for attachment to a towing vehicle.

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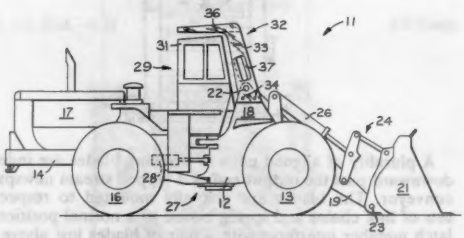
**3,599,813**
**ROLLOVER SAFETY STRUCTURE FOR ARTICULATED LOADERS**

Clayton J. Totz, Geneva, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Apr. 13, 1970, Ser. No. 27,902
Int. Cl. B66f 9/00
U.S. Cl. 214—140 6 Claims



In an articulated loader vehicle having a rear frame carrying the engine and operator's station and having a front frame with spaced upright towers supporting lift arms and a bucket and having means for pivoting one frame relative to the other for steering purposes, rollover protection for the operator is provided by a post extending upwardly from each loader tower to a rectangular top member which is cantilevered back over the operator's station. This disposition of

the rollover structure on the front frame towers maximizes strength without interfering with other loader components and avoids interference with the operator's view of the direction of travel of the vehicle and the bucket during turning.

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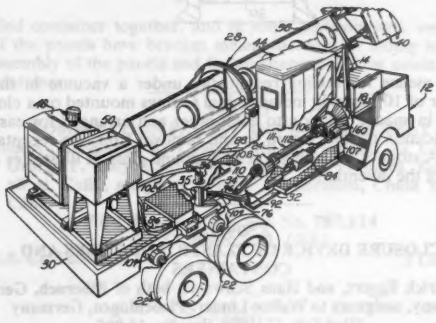
**3,599,814**
**MATERIAL-HANDLING VEHICLE**
**Keith E. Brownfield, Lansing, Mich., assignor to The Warner & Swasey Company, Cleveland, Ohio**
**Filed June 17, 1969, Ser. No. 834,028**
**Int. Cl. E02f 3/00**
**U.S. Cl. 214—141** **4 Claims**



An improved vehicle includes a truck mounted material-handling mechanism having a main cab or operator's station from which the vehicle is driven over a road or highway and a second cab or operator's station from which the material-handling mechanism is operated. When the vehicle is being driven over the road, power is transmitted to the driving wheels of the vehicle from a main engine by a main drive line which includes a main transmission assembly. When the material handling mechanism is being operated, a control means in the second cab or operator's station is selectively operable to drive the vehicle with power transmitted from an auxiliary engine to the main transmission assembly in the main drive line by an auxiliary drive line. The auxiliary drive line includes a pump which is driven by the auxiliary engine to provide fluid under pressure to operate a fluid motor which is drivingly connected with the main transmission assembly.

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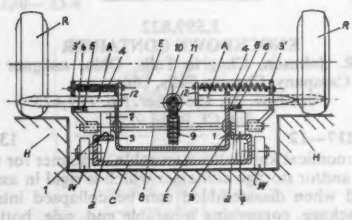
**3,599,815**
**CHARIOT FOR THE TRANSPORT OF VEHICLES MAINLY FOR PARKING ON DIFFERENT FLOOR LEVELS**
**Italo Bianchi, Nice, France, assignor to S. A. R. L. Bianchi Freres & Co. "BOXDAD,", Nice, France**
**Continuation of application Ser. No. 671,049, June 27, 1967, now abandoned. This application July 18, 1969, Ser. No. 846,645**
**Int. Cl. E04 6/06**
**U.S. Cl. 214—331** **7 Claims**



The present invention concerns a carriage for parking vehicles such as automobiles in multilevel parking garages. The carriage consists of a lower, wheeled carrier and an upper frame assembly which rests upon the carrier. The frame assembly includes at each wheel a plurality of horizontal, spring-loaded rods or pins which are normally biased toward the outside. Before the automobile is set on the carriage, the rods are drawn inwardly. When the tires or wheels are opposite their respective sets of inwardly drawn shafts, the rods are moved outwardly. Some of the rods will engage the tire or wheel, others will move even further out, just in front of and in back of each tire so that forward or backward motion of the car is prevented. The rods also support the car when it is lifted from the lower carrier assembly.

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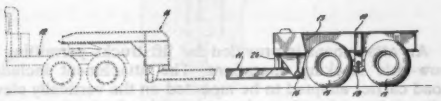
**3,599,816**
**DETACHABLE GOOSENECK TRAILERS**
**Maurice Moiriat, Montreal, Quebec, Canada, assignor to Gaymor Trailers Limited, St. Hubert, Quebec, Canada**
**Filed July 7, 1969, Ser. No. 839,226**
**Int. Cl. B60p 1/28**
**U.S. Cl. 214—506** **6 Claims**



A load carrying bed has its rear end pivotally connected to a bracket arm extending below a rear wheel assembly. The rear wheel assembly is pivotally mounted so that the load carry bed may touch the ground at the rear end, the said bed being free at the front end so that it may lie flat on the ground. A device for raising the rear end and holding it in a raised position is combined with rear wheel assembly.

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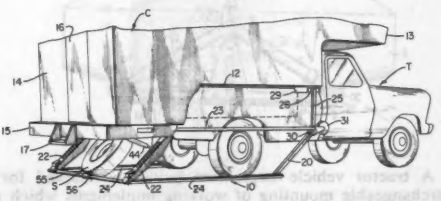
**3,599,817**
**APPARATUS FOR LOADING AND UNLOADING CAMPER BODIES**
**Dale L. Bargman, Jr., Broomfield, Colo., assignor to Colorado Leisure Products, Inc., Broomfield, Colo.**
**Filed June 16, 1969, Ser. No. 833,391**
**Int. Cl. B60p 1/64**
**U.S. Cl. 214—515** **14 Claims**



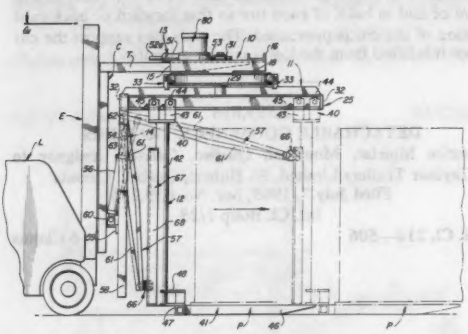
Parallelogram linkage assemblies are releasably attachable to opposite sides of a camper body and the like, a drive mechanism being selectively activated to advance the linkage between a position supporting the camper in a raised position for placement on the bed of a platform, such as, the flatbed of a vehicle and a lowered position at rest on the ground. In one lowered position of the camper, supporting wheels are engageable with the ground surface to facilitate movement of the camper from place to place.

**3,599,818**

## LOAD SUPPORT ATTACHMENT FOR VERTICAL LIFT TRUCKS PROVIDING HORIZONTAL AND ROTATIONAL DISPLACEMENT OF A LOAD

George E. Stanton, 7945 Hoover Road, Orient, Ohio

Filed Aug. 13, 1969, Ser. No. 849,784
Int. Cl. B66f 9/14
U.S. Cl. 214—620 5 Claims



An attachment is provided for lift trucks permitting narrow-aisle stacking operations. The attachment includes a load carrier adapted to be mounted on the vertically elevatable carriage of a lift truck and capable of selective rotational displacement and horizontal displacement of a load relative to the lift truck in accomplishing stacking of loads in laterally offset relationship to the lift truck and its line of travel. The load carrier is mounted on a support structure for horizontal displacement which is effected by a selectively operable lever arm mechanism and the support structure is mounted on a support frame for rotational movement about a vertical axis by selectively operable motive means.

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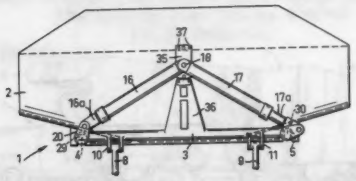
**3,599,819**

## TRACTOR VEHICLE IMPLEMENT HOLDER FOR INTERCHANGEABLE MOUNTING OF IMPLEMENTS

Tage Nils Wilhelm Leijon, Sturevagen 18, Stocksund, Sweden

Filed Jan. 10, 1969, Ser. No. 790,391
Claims priority, application Sweden, Feb. 28, 1969, 2,566/1968
Int. Cl. E02f 3/70
U.S. Cl. 214—768 1 Claim



A tractor vehicle implement holder is adapted for interchangeable mounting of working implements which may have fixed or movable relationship to the holder.

The implement comprises, for example, a front dump bucket, a front and side dump bucket, or a lumber fork lift. The holder comprises a drive means such as a hydraulic jack for pivoting such interchangeable implement which is movable relative to the holder. The drive means is operatively connected to a locking means so as to turn or displace it between its locking and releasing positions.

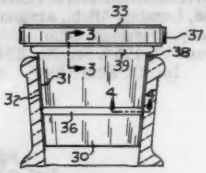
The locking means is either a part of a turnable pivot shaft for the implement, said pivot shaft being positioned on the holder, or a displaceable locking element, in the locking position engaging a pivot shaft attached to the implement.

**3,599,820**

## HIGH VACUUM-SEALING CLOSURE

Kenneth P. Lee, Lexington, Ky., assignor to The University of Kentucky Research Foundation, Lexington, Ky.

Filed July 22, 1969, Ser. No. 843,704
Int. Cl. B65d 39/00
U.S. Cl. 215—48 3 Claims



A means for sealing receptacles under a vacuum in the order of $10^{16}$ mmHg includes dual O-rings mounted on a closure in spaced relation to each other and arranged for easy application of the closure to and removal from the receptacle. A stopper providing a sealed ground glass fit illustrates a use of the invention.

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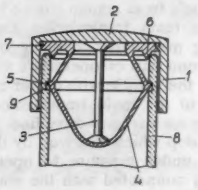
**3,599,821**

## CLOSURE DEVICE OF PLASTIC FOR TUBES AND CONTAINERS

Geinrich Eggert, and Hans Schwartz, both of Biberach, Germany, assignors to Walter Linder, Ploochingen, Germany

Filed Feb. 17, 1970, Ser. No. 12,085
Claims priority, application Germany, Feb. 21, 1969, P 19 08 821.2
Int. Cl. B65d 39/12
U.S. Cl. 7 Claims



A closure device of plastic which comprises a cap which is to be fitted over and pressed upon the open end of a container and carries on the inside of its top a resilient hollow plug which is inserted into the open end of the container and has one or more locking projections which snap into an inner annular groove in the container wall or over an annular projection on this wall when the cap seals the container tightly. For unlocking the plug from the container wall to permit the cap to be withdrawn, a central part of the top is depressed, whereby a central stem at the inside of the plug effects a deformation of the plug so that the locking projection of projections of the plug are retracted from the annular groove or projection of the container wall.

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**3,599,822**

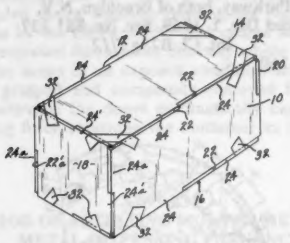
## KNOCKDOWN CONTAINER

George R. Johnson, Chagrin Falls, Ohio, assignor to The Arpax Company, Chagrin Falls, Ohio

Filed Nov. 27, 1968, Ser. No. 779,425
Int. Cl. B65d 9/34
U.S. Cl. 217—12 13 Claims

An economical knockdown reusable container for use as a shipping and/or storage container which is rigid in assembled form and when disassembled can be collapsed into a flat return package, comprising separable end, side, bottom and top wall panels formed of low cost materials. The wall panels are uniformly recessed along predetermined portions of their peripheries for forming an interlocking relationship between

the panels to aid in maintaining a rigid assembly. In certain embodiments high strength pressure sensitive tape sections are used for positively holding the wall panels of the assembled container together, and in some embodiments, certain of the panels have bracket means thereon for aiding in the assembly of the panels and for maintenance of the assembled container.



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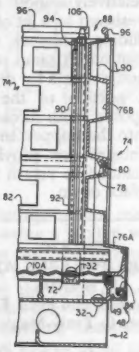
**3,599,823**

**COMBINATION PALLET AND BOX ASSEMBLY**

**Robert T. Morris, El Cajon; Jack M. Palmer, El Cajon; George F. Riley, Chula Vista, and Derek F. Smith, Bonita, all of, Calif., assignors to Rohr Corporation, Chula Vista, Calif.**

**Filed Dec. 26, 1968, Ser. No. 787,114**
**Int. Cl. B65d** *7/32, 19/12*
**U.S. Cl. 220—4 R** **3 Claims**



A pallet is formed of runners having a generally U-shaped cross section and a plurality of floor members which are interlocked to one another and connected to said runners. The runners and floor members are arranged so that side panels and panel corner locking members can conveniently be attached thereto as accessories to form a storage box of variable height.

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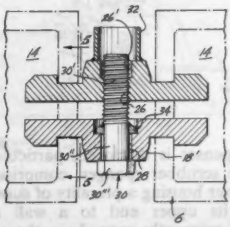
**3,599,824**

**COUPLING DEVICE FOR CARGO CONTAINERS**

**Frederick C. Pneuman, Bellevue, Wash., and Charles Y. Hale, Mountlake Terrace, both of, Wash., assignors to Weyerhaeuser Company, Tacoma, Wash.**

**Filed May 19, 1969, Ser. No. 825,634**
**Int. Cl. B65d** *21/02*
**U.S. Cl. 220—23.4** **7 Claims**



A coupling device is disclosed for interconnecting cargo containers having pairs of spaced oppositely disposed lugs thereon. The coupling device is interengaged with and between the lugs of the containers, and is particularly adapted for rigidly interconnecting a pair of spaced mutually aligned modular USASI/ISO or similar cargo containers having standard hollow slotted fittings in the opposing corners thereof, in which case of such device is interposed between each pair of opposing corner fittings and interengaged with and between opposing edge portions of the slotted end openings in the fittings.

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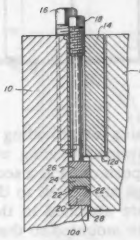
**3,599,825**

**PRESSURE VESSEL WITH SEAL RING CONSTRUCTION**

**Svend M. Jorgensen, Tenafly, N.J., assignor to Foster Wheeler Corporation, Livingston, N.J.**

**Filed July 15, 1969, Ser. No. 841,826**
**Int. Cl. B65d** *53/00*
**U.S. Cl. 220—46** **19 Claims**



A pressure vessel including an open-ended first vessel member, and a second vessel member having at least a portion thereof extending into the open end of the first member and defining a circular space with the inner wall of the first member. A plurality of sealing rings are disposed in the space and are compressed to provide a seal between the members.

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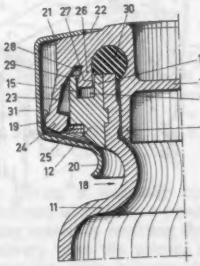
**3,599,826**

**CONTAINER SEALED AGAINST LIQUIDS**

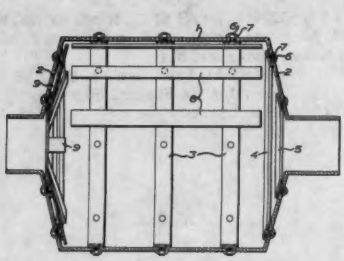
**Heinz Rocher, 23 Stahlenstrasse, 5211 Lulsdorf, Germany**

**Filed June 16, 1969, Ser. No. 888,171**
**Claims priority, application Germany, June 15, 1968, P 17 61 614.7**
**Int. Cl. B65d** *53/00*
**U.S. Cl. 220—46** **8 Claims**



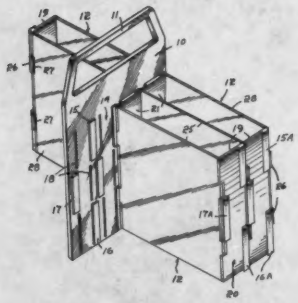
A liquid sealed container and lid made of synthetic material of the type wherein the lid is sealed with respect to the container opening by means of matching annular sealing ribs and grooves and is held in position by a clamping ring characterized by the provision of at least one sealing rib having a sidewall conically expanding toward the free end of the rib and a groove engaged by the rib has its sidewall adjacent the conical rib sidewall pressed onto the latter when the lid is in position.

3,599,827
METHODS OF PROVIDING WALLS WITH WEAR-RESISTANT LININGS
BO K. G. Persson, Trelleborg, Sweden, assignor to Trelleborgs Gummifabriks Aktiebolag, Trelleborg, Sweden
Filed Nov. 25, 1968, Ser. No. 778,555
Claims priority, application Sweden, Dec. 19, 1967, 17401/67
Int. Cl. B23k 1/16; B23p 19/00
U.S. Cl. 220—63 8 Claims



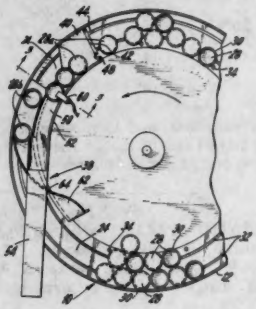
A method and apparatus for providing a wall having holes in it at a first predetermined spacing with lining elements having fastening means positioned at a second predetermined spacing. Anchoring strips are bolted to the holes in the wall and connecting strips are attached to the anchoring strips. The connecting strips are mounted so that adjacent connecting strips are spaced from each other at the second predetermined spacing. The lining elements are attached to the connecting strips by means of the fastening means.

3,599,828
MODULAR CARRIER FOR SUCH ARTICLES AS TAPE REELS
Charles T. Conway, 733 E. 5th St., South Boston, Mass., and John J. Campbell, 61 Plymouth St., Cambridge, Mass.
Filed July 17, 1969, Ser. No. 842,561
Int. Cl. B65d 75/00
U.S. Cl. 220—102 4 Claims



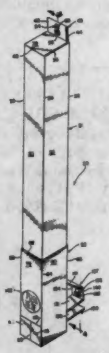
A modular carrier is disclosed that consists of a plurality of identical holders, and a support, the support and one end wall of each holder having attaching means by which attaching means on the other end walls of the holder may be detachably connected thereto and supported thereby. The holders are open at the front and have means by which they may be assembled in a side-by-side relationship with their open fronts either closed by the rear wall of another holder or by a front wall.

3,599,829
HOPPER-TYPE APPARATUS FOR ORIENTING AND FEEDING BOTTLE AND JAR CAPS, OR THE LIKE
Samuel A. Aidlin, 214 Beaumont St., and Stephen H. Aidlin, 3855 Shore Parkway, both of Brooklyn, N.Y.
Filed Dec. 1, 1969, Ser. No. 881,237
Int. Cl. B23g 7/12
U.S. Cl. 221—160 8 Claims



A hopper-type device for orienting and feeding relatively flat articles having a relatively smooth surface on one side and a broken surface, resistant to a jet of air under pressure, on the other side, including a hopper, a rotating feed disc within the hopper and an outlet ramp positioned to receive articles from the disc, and a nozzle for directing a jet of compressed air against a portion of the ramp to dislodge therefrom articles disposed with broken surface upward thereon for returning into the hopper. In a preferred form of the device, inverted means are provided on which the dislodged articles are landed to return them back into the hopper with broken surface down.

3,599,830
ARTICLE DISPENSER OPERABLE WITHOUT THE USE OF HANDS
James R. Gilchrist, Clarence, and Peter F. Gannon, Lakeview, both of, N.Y., assignors to Truly-Magic Products, Inc., Buffalo, N.Y.
Filed June 23, 1969, Ser. No. 835,371
Int. Cl. A24f 15/04
U.S. Cl. 221—188 3 Claims



An article dispenser is disclosed, particularly suited for dispensing sterile scrubber sponges, comprising a vertically elongated container housing a plurality of superimposed articles hinged at its upper end to a wall and extending downwardly and outwardly away from the wall so that its

lower end is spaced from the wall, being yieldingly biased into that ready position, and an article projector interposed between the wall and an article in the container arranged opposite a doorway in the front of the container closed by spring loaded doors, whereby pushing the container toward the wall as by the elbow of the user causes an article to be partially projected through the doorway where it is yieldingly held by the doors in an exposed condition accessible to be manually grasped and completely removed from the container whereupon the doors automatically close, release of the pushing force returning the container to its ready position.

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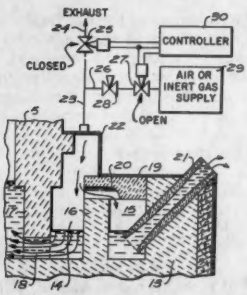
**3,599,831**

## METHOD OF AGITATING MOLTEN METAL IN A METAL-DISPENSING FURNANCE

**Henry L. Harvill, Riverside, Calif., and John I. Harvill, P.O. Box 777, Corona, Calif.**

Division of Ser. No. 664,372, Aug. 30, 1967, Pat. No. 3,510,116. Filed Nov. 3, 1969, Ser. No. 873,235
Int. Cl. G01f *11/28*
U.S. Cl. 222—1 3 Claims




A method of agitating molten metal, utilizing a metal-dispensing furnace having a molten metal reservoir, a surge chamber joined to the reservoir by a submerged opening, and a dispensing chamber having a discharge spout and intermittently connected with the surge chamber over a baffle wall separating the surge and dispensing chambers.

The surge and dispensing chambers being intermittently exposed to a common source of air or inert gas under pressure, and to a common exhaust so that the molten metal in the dispensing chamber is periodically discharged, while simultaneously molten metal in the surge chamber is caused to backflow into the reservoir, agitating the metal therein, particularly at the bottom of the reservoir; then, alternately, is permitted to refill the surge and dispensing chambers causing further agitation of the molten metal in the reservoir.

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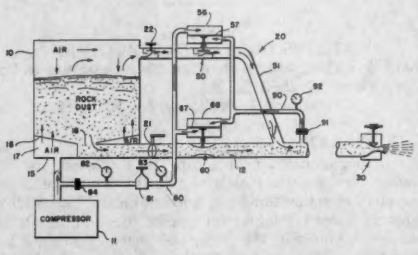
**3,599,832**

## FLOW CONTROL OF FLUIDIZED MATERIAL

**Carlowen Smith, Pittsburgh, Pa., assignor to Industrial Pneumatic Systems, Inc., Fairmont, W. Va.**

Filed Dec. 23, 1969, Ser. No. 887,572
Int. Cl. B67b *7/00*
U.S. Cl. 222—1 9 Claims




This apparatus controls the flow of fluidized granular material by utilizing the pressure in the conduit to actuate one valve to increase the supply of gas to the conduit and another valve to restrict the flow of material in the conduit. Any increase in the amount of material will increase the pressure and add more gas and reduce the flow of material into the conduit to maintain continuous flow of fluidized material.

When used in a rockdusting system, the fluidized material is discharged from a nozzle at the end of the conduit under control of a manually actuated valve. Closing the valve causes pressure in the conduit closure of the valve restricting flow of the material. The air supply to the conduit will be increased and the supply of material reduced with decrease in the discharge of material at the nozzle.

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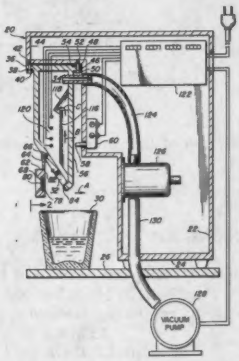
**3,599,833**

## LIQUID DISPENSER AND RECORDER MEANS

**Arthur Reichenberger, 1916 N. 21st Place, Phoenix, Ariz.**

Filed Aug. 7, 1969, Ser. No. 858,234
Int. Cl. B67d *5/08*
U.S. Cl. 222—23 26 Claims




A liquor dispenser and recorder means particularly adapted for use in dispensing liquors in public barrooms, wherein a plurality of containers holding various priced liquors are provided with outlet fixtures cooperable with a stationary fixture engaging means, such that each outlet fixture of each container is physically distinctively cooperable with the engaging fixture so as to individually energize means for dispensing liquor from the respective container and for energizing a counter with respect to the value of the liquor in the respective container.

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**3,599,834**

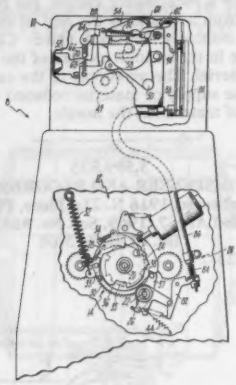
## PRINTER-CONTROLLED INTERLOCK

**Silvio Conte, East Hartford, and Thomas W. Evans, Newington, both of, Conn., assignors to Veeder Industries Inc., Hartford, Conn.**

Filed May 7, 1969, Ser. No. 822,666
Int. Cl. B67d *5/22*
U.S. Cl. 222—30 5 Claims

A fuel pump having a manually operable printer for recording each delivery of fuel and a printer-controlled interlock for preventing manually resetting the pump register for a succeeding delivery until the printer has been manually operated to record the prior delivery. After the register is reset the printer may be manually operated through a first phase of operation to provide an initial printout whereupon the register reset mechanism is locked to prevent resetting the register again until after the printer is manually operated through a second phase of operation to provide a final printout of the fuel delivery. A printer ticket tray is reciprocated in conjunction with the operation of the printer and a reciprocable slide is connected to latch the register reset mechanism when the ticket tray and slide are actuated to a forward position by the printer operating handle during its first phase of operation. The slide is releasably latched in its

forward position and the slide latch is released by a printer platen as it moves to provide the final printout to provide for



spring retraction of the slide for unlocking the register reset mechanism.

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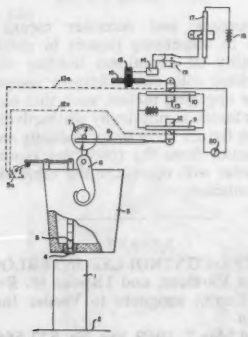
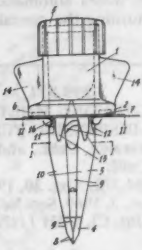
**3,599,835**
**DISPENSING APPARATUS FOR AND METHODS OF CASTING**
**Friedrich Kocks, Freiligrathstrasse 1, 4 Dusseldorf, Germany**
**Filed Nov. 3, 1968, Ser. No. 775,337**
**Claims priority, application Germany, Sept. 20, 1968, P 15 83 658.5**
**Int. Cl. B65h** *1/08*
**U.S. Cl. 222—58** **6 Claims**



A method and apparatus are provided for maintaining a constant casting speed in casting molds by the steps of weighing the molten metal before casting, weighing the molten metal at least at spaced time intervals during casting and adjusting the flow of steel into said casting mold at said spaced time intervals to discharge a substantially identical weight amount in each time interval. An apparatus for maintaining a constant speed in casting provides a pouring ladle, discharge means on the ladle, weighing means supporting said ladle, a voltage transmitter sensitive to weight change connected to the weighing means and transmitting a voltage proportional to a change in weight, a voltage comparator receiving the transmitted voltage, comparing the same with a standard voltage representing a desired casting speed and transmitting a signal indicating a deviation from the standard.

**3,599,836**
**POURER TUBE FOR FLUID CONTAINERS**
**Robert Hegi, 8113 Boppelsen, Zurich, Switzerland**
**Filed Apr. 8, 1969, Ser. No. 814,238**
**Claims priority, application Switzerland, Apr. 23, 1968, 6398/68**
**Int. Cl. B67b** *7/26*
**U.S. Cl. 222—90** **1 Claim**



A pourer tube for cans and the like fluid containers including a body having a tubular discharge portion at one end and a container-piercing means at the other end. A radial flange having a sealing ring thereon is provided intermediate the two ends, and the body between the flange and the container-piercing means is tapered toward the container-piercing means. The tapered body portion includes cam surfaces whereby upon inserting the pourer tube into a container and turning the tube, the cam surfaces and the container opening thus formed cooperate so as to draw said flange and said sealing ring into sealing relationship with the container.

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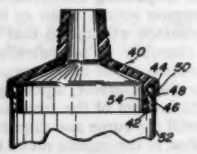
**3,599,837**
**PLASTIC DISPENSING CONTAINER AND CLOSURE THEREFOR**
**Douglas W. Anderson, Palatine, Ill., assignor to Dave Chapman, Goldsmith & Yamosaki, Inc., Chicago, Ill.**
**Filed June 6, 1969, Ser. No. 831,140**
**Int. Cl. B65d** *35/08*
**U.S. Cl. 222—107** **10 Claims**




A squeezable-type collapsible container and a method of making it includes a molded nylon nozzle and shoulder part having an ethyl vinyl acetate plastic band injection molded directly onto and around a skirt portion thereof. A tube having a polyethylene inner surface is fitted over the band and a heat seal is effected between the band and the adjoining wall of the tube to fixedly secure the tube to the nylon part.

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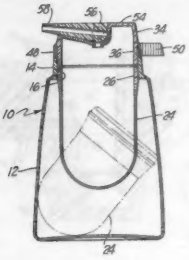
**3,599,838**
**MIXING CONTAINER STRUCTURE**
**Donald H. LaVange, East Douglas, Mass., assignor to Polytop Corporation, Slatersville, R.I.**
**Filed June 2, 1969, Ser. No. 829,599**
**Int. Cl. B67d** *5/56*
**U.S. Cl. 222—129** **10 Claims**

A mixing container structure is disclosed for use in shipping two materials such as two fluids so that these two materials are separated from one another. This structure includes an outer container for one of these materials and an inner container for the other of these materials located within the outer container. The top of the inner container fits closely within so as to form a seal with the interior of the

neck of the outer container. A closure member is located on the outer container so that the skirt on this closure member fits closely within and forms a seal against the interior of the



neck on the outer container. The closure member is capable of being moved so that this skirt forces the inner container into the interior of the outer container so that the materials within these containers can mix.

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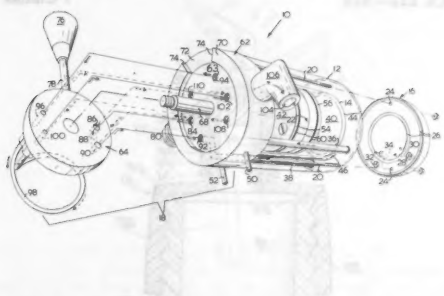
**3,599,839**

**VOLUMETRIC METER**

**William A. Hansen, 95 Ashland, Winnipeg 13, Manitoba, Canada**

**Filed Aug. 4, 1969, Ser. No. 847,152**
**Int. Cl. B67d** *5/62*
**U.S. Cl. 222—146 C** **6 Claims**



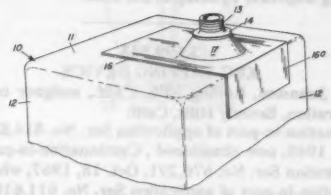
A volumetric meter is described which can be connected to a supply of liquid and is useful for dispensing predetermined quantities of the same. This liquid can be a carbonated beverage such as a soft drink or beer, or the liquid can be tea, coffee, soup or other hot liquid. The present volumetric meter comprises, in a broad sense, a tubular cylinder having two open ends that are closed by an end cap and a head cap, respectively. An axially movable piston is mounted within this cylinder and preferably is in sealed engagement peripherally therewith. This piston divides the cylinder into two chambers. The head cap includes a stationary portion, and a movable portion positionable between a first and a second position. Each portion is provided with liquid conducting channels, of which certain channels are in alignment in each of said positions. Depending upon which channels are in alignment, one of the chambers is in communication with a supply of the liquid for filling, while the other chamber is brought into communication with a discharge outlet and is simultaneously emptied. In one form, the head cap is provided with a choke coil which serves to control the discharge flow of the liquid as it is being dispensed. Preferably, the present volumetric meter is provided with two concentric cylinders one within the other for defining an annular interspace therebetween. This interspace is connected by suitable conduit means to a supply of coolant or heating fluid, depending upon whether the liquid being dispensed is cold or hot. The supply of liquid is under pressure. This pressure serves as the driving force causing movement of the piston to either end of the cylinder to dispense the predetermined quantity or volume of liquid from the chamber ahead of it.

**3,599,840**

**DEVICE FOR POSITIONING FILM BAG LINERS IN OUTER CONTAINERS**

**Charles A. Speas, Towson, Md., assignor to Hedwin Corporation, New York, N.Y.**

**Filed Aug. 25, 1969, Ser. No. 852,573**
**Int. Cl. B67d** *5/06*
**U.S. Cl. 222—183** **12 Claims**



A device for positioning film bag liners in outer containers so as to prevent the collapse of the bag liner and retain its pouring spout in position for ready access through an accommodating opening in an outer container. A positioning sheet, preferably consisting of semirigid material, is secured to the liner at the base of the pouring spout and extends radially from the latter. By anchoring the extended portion or portions of the positioning sheet to the outer container, the pouring spout and the area of the liner immediately surrounding the same are maintained in position for ready access through an opening in the outer container, thus preventing displacement of the liner and its pouring spout and providing torque resistance for pouring spouts having screw-threaded or twist-off closures.

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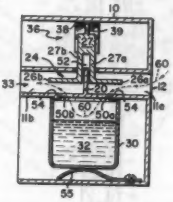
**3,599,841**

**ODOR CONTROL APPARATUS, assignor to Honeywell Inc., Minneapolis, Minn.**

**Filed Aug. 6, 1969, Ser. No. 847,981**
**Int. Cl. B67d** *5/54*
**U.S. Cl. 222—193** **7 Claims**



Apparatus for dispensing vaporizable air treating material having a remotely controllable air valve for regulating air flow through a vaporizing chamber containing the air treating material.

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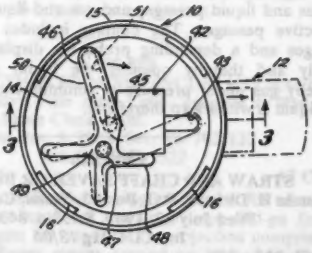
**3,599,842**

**MEASURING DISPENSER WITH AGITATOR FOR COMMINUTED MATERIAL**

**Samuel B. Boster, 7304 Reading Road, Cincinnati, Ohio**

**Filed Oct. 16, 1968, Ser. No. 768,031**
**Int. Cl. G01f** *11/14*
**U.S. Cl. 222—245** **4 Claims**



This disclosure describes a dispenser for comminuted material, such as "instant" coffee contained in a jar, the

dispenser including a reciprocated slide having a measuring dispenser opening that is movable between a jar discharge opening and a dispensing opening, and an agitator pivotally mounted above the jar discharge opening and having a drive connection with the reciprocated slide to preclude buildup of comminuted material around said discharge opening and insure the delivery of an accurate amount of material to the measuring dispenser opening of the slide.

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**3,599,843**

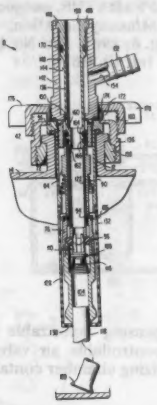
**KEG TAPPING DEVICE**

**Mack S. Johnston, Rolling Hills, Calif., assignor to Republic Corporation, Beverly Hills, Calif.**

**Continuation-in-part of application Ser. No. 814,833, Mar. 26, 1969, now abandoned , Continuation-in-part of application Ser. No. 676,291, Oct. 18, 1967, which is a continuation-in-part of application Ser. No. 611,610, Jan. 25, 1967, now Patent No. 3,410,458, which is a continuation-in-part of application Ser. No. 587,627, Oct. 18, 1966, now Patent No. 3,442,448, which is a continuation of application Ser. No. 406,682, Oct. 27, 1964, now abandoned , which is a continuation-in-part of application Ser. No. 502,092, Oct. 25, 1965, now Patent No. 3,439,844, Continuation-in-part of application Ser. No. 395,084, Jan. 25, 1966, now Patent No. 3,231,154, which is a continuation of application Ser. No. 150,982, Nov. 8, 1961, now abandoned. This application Apr. 14, 1969, Ser. No. 815,542**

**Int. Cl. B65d** *83/00, 83/14*

**U.S. Cl. 222—399** **26 Claims**



Disclosed is a tapping device for beer kegs and the like including a keg adapter semipermanently secured within the keg opening and a coupler releasable secured to the adapter. The adapter includes a axially movable subassembly containing gas and liquid passages and gas and liquid valves in the respective passages. The coupler includes liquid and gas passages and a depending probe for displacing the subassembly and thereby opening the liquid and gas valves whereby gas under pressure is communicated into the keg and liquid is withdrawn therefrom.

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**3,599,844**

**STRAW AND CHAFF SAVER OR BUNCHER**

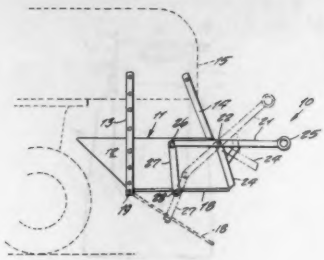
**Benjamin H. Dickson, P.O. Box 43, Yuma, Colo.**

**Filed July 22, 1969, Ser. No. 843,542**

**Int. Cl. G01g** *13/06*

**U.S. Cl. 222—508** **4 Claims**

An attachment for a harvester combine, the attachment comprising a basket having a downwardly pivotable floor attached to counter weighed linkages for the purpose of



dispensing bunches of straw and chaff collected within the basket.

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**3,599,845**

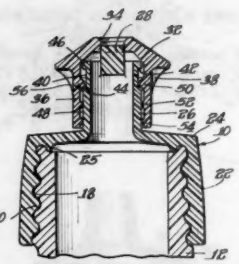
**CONTAINER CLOSURE**

**Christian F. Miller, Palos Park, Ill., assignor to VCA Corporation (formerly k/a Valve Corporation of America), Greenwich, Conn.**

**Filed July 23, 1969, Ser. No. 844,066**

**Int. Cl. B67d** *3/00*

**U.S. Cl. 222—521** **7 Claims**



A valved closure and dispensing assembly for containers, such as bottles, jars and the like, including a main closure body of relatively hard plastic material and having a neck portion with a closure pin or stopper of reduced cross section fixed centrally at the outer end of the neck opening; and a sliding closure cap member of relatively softer plastic material having a depending skirt externally interfitting and interlocking with the outer surface of the neck portion for limited sliding movement relative thereto and having a central opening through the top clearing the closure pin or stopper for dispensing purposes and snugly receiving the pin or stopper therein for closing the neck opening against dispensing.

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**3,599,846**

**MECHANICAL CARAFE**

**Colon M. Stephenson, Olathe, Kans., assignor to Alprod Corporation, Chicago, Ill.**

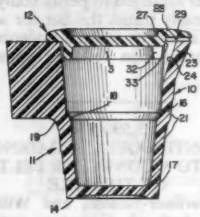
**Filed Aug. 13, 1969, Ser. No. 849,855**

**Int. Cl. B67d** *3/00*

**U.S. Cl. 222—553** **4 Claims**

An expanded foam polystyrene carafe including a body having a pouring spout. A lid is frictionally seated for rota-

tion within the open end of the body and has a nose formed with a groove on the underside thereof. The groove provides a pouring passage when the lid nose is aligned with the



pitcher pouring spout. Rotation of the lid so that the lid nose and pouring spout are angularly displaced is operative to seal or close the pouring spout.

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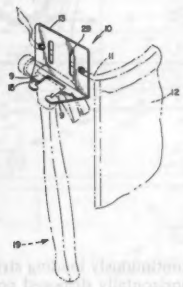
3,599,847

**BELT-SUSPENDED HAMMER HOLDER**

Gideon R. Danielson, 35 Sandholm St., Geneva, Ill.

Filed July 30, 1969, Ser. No. 846,083
Int. Cl. A45f *5/00*
U.S. Cl. 224—5 A 9 Claims



The hammer holder is an L-shaped bracket having a vertical portion and a horizontal portion. Holes in the vertical portion permit it to be suspended from a belt or apron string. The horizontal portion has a U-shaped opening for receiving the shank of a hammer head. Lugs at the entrance of the opening prevent sideways removal of the hammer head. The external edges of the horizontal portion are diagonal, causing the hammer handle to rock against the leg of the user.

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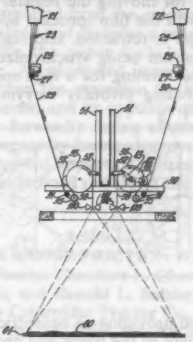
3,599,848

**METHOD AND MEANS FOR STRAND DISTRIBUTION**

J. Randall Thumm; George E. Smock, and Richard E. Pitt, all of Newark, Ohio, assignors to Owens-Corning Fiberglas Corporation

Continuation of application Ser. No. 847,520, July 22, 1969, now abandoned, which is a continuation of application Ser. No. 530,518, Feb. 28, 1966, now abandoned. This application May 14, 1970, Ser. No. 37,437
Int. Cl. C03b *37/02*
U.S. Cl. 226—7 32 Claims

Method and apparatus for distributing strands on a collecting surface aerodynamically. Embodiments of fluid nozzle and air foil members divert the strands after the strands have had a linear velocity imparted thereto to selected deposition points without touching the strands. A sweeping distribution of strands back and forth across a collection surface can be obtained by controlling the flow of fluid through the nozzle,



controlling the air pressure between an air foil and a strand, by changing the angle of attack of an air foil, etc.

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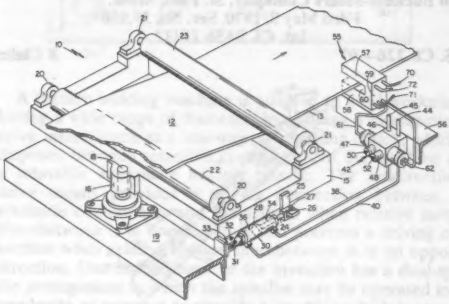
3,599,849

**WEB REGISTRY CONTROL APPARATUS**

John G. Callan, Sharon, Mass., assignor to Knox, Inc., South Walpole, Mass.

Filed July 24, 1969, Ser. No. 844,260
Int. Cl. B65h *25/26*
U.S. Cl. 226—22 7 Claims



A detector (including, e.g., a U-shaped sensing head) for sensing departures of a portion of a travelling web, such as its edge, and initiating corrective action by adjusting equipment, wherein presence of the web within a detector nul zone indicative of a desired web edge position deflects a fluid jet at the web side of the nul zone which would otherwise operate adjusting equipment in one direction (e.g., which in turn operates the adjusting equipment), by being received in a passage on the opposite side of a web to produce a fluid jet therein for operating the adjusting equipment; and wandering of the web edge beyond the far side of the nul zone interrupts a jet deflecting means (e.g., another jet) which, unless interrupted, prevents a jet at the far side of the nul zone from operating adjusting equipment in the opposite direction. Sensing jets are used to operate directly fluid-operated valves controlling the web-adjustment equipment.

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3,599,850

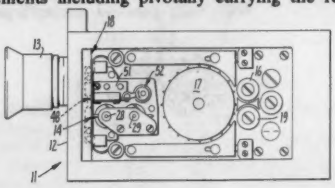
**MOTION PICTURE FILM-ADVANCING MECHANISM**

Ernest M. Whitley, Palo Alto, Calif., assignor to Red Lake Laboratories, Santa Clara, Calif.

Filed Dec. 9, 1968, Ser. No. 782,132
Int. Cl. G03b *1/22*
U.S. Cl. 226—56 12 Claims

A motion picture film-advancing mechanism for advancing film having sprocket holes therein in stop-and-go fashion through a film gate for exposure or projection comprising a film-advancing finger means carried on spaced cranks for movement in a circular path for engaging the film and ad-

vancing it intermittently in a cyclic action, and a register pin carried for axial movement in a mounting block and having an eccentric drive for moving the register pin intermittently into engagement with the film sprocket holes for holding the film when the finger is retracted, said register pin drive and finger drive mechanism being synchronized through a common gear train and forming for a high-speed operation; the improvements including pivotally carrying the register pin



mounting block and providing an eccentric adjustment screw for adjusting the pivot of the block and providing fine adjustment of the register pin to obtain accurate adjustment of the spacing between the register pin and finger, providing a lost motion drive for the register pin whereby the register pin may be retracted while the finger is in a retracted position, and providing means for eliminating play and backlash including a pressure bearing member on a ball bearing mounting for the retractable fingers.

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**3,599,851**

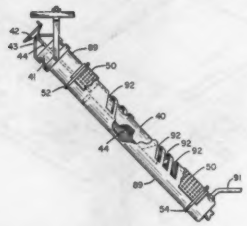
**HYDRODYNAMIC TURNOVER MECHANISMS**

**Harland R. Hedlund, St. Paul; Harry K. Wethe, Minneapolis, and Vernon L. Turner, Lindstrom, all of, Minn., assignors to Buckbee-Mears Comapny, St. Paul, Minn.**

**Filed May 8, 1970, Ser. No. 35,850**

**Int. Cl. B65h *17/32***

**U.S. Cl. 226—97** **8 Claims**



A member for hydrodynamically supporting and changing the orientation of a continuously moving flexible sheet of material. The material floats on a cushion of air forced out of slots in the member which member is covered with a plastic coated diffusing screen. Inside the member a movable sleeve controls how many slots are open to the passage of air.

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**3,599,852**

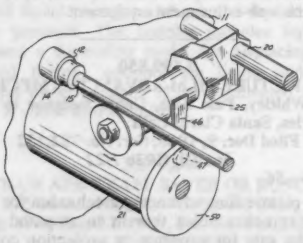
**AUTOMATIC BAR FEEDER ATTACHMENT FOR MULTIPLE SPINDLE SCREW MACHINES**

**Josef Eichenhofer, 120 Oakdale Road, Downview 479, Ontario, Canada**

**Filed Dec. 12, 1969, Ser. No. 884,653**

**Int. Cl. B65h *17/22***

**U.S. Cl. 226—155** **6 Claims**



In a spindle bar machine having a hollow spindle through which a workpiece bar is cyclically advanced, a feeder formed of an elongated housing arranged transversely to the bar and rockingly mounted upon a machine shaft by a journal formed upon one end of the housing, with a motor arranged within the housing, and having a constantly rotating drive shaft extending out of the opposite end of the housing and carrying a roller arranged to periodically peripherally engage and longitudinally thrust the bar for advancing it. The housing is rocked about its journal towards and away from the bar by a housing cam follower engaging a machine rotated cam.

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**3,599,853**

**DEVICE FOR CONTINUOUSLY LOADING STRIP-FORM MATERIAL ONTO A CONVEYOR BELT OF A DRYER OR THE LIKE**

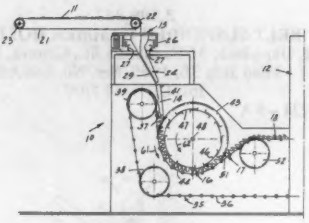
**Walter Munch, Berliner-Strasse, and Wilhelm Bachmann, Friedhofsstrasse, both of, Germany, assignors to Schilds Aktiengesellschaft, Bad Hersfeld, Germany**

**Filed July 8, 1969, Ser. No. 839,976**

**Claims priority, application Germany, July 17, 1968, P 17 60 902.8**

**Int. Cl. B65h *29/16***

**U.S. Cl. 226—171** **8 Claims**



A device for continuously loading strip-form material onto a substantially horizontally disposed conveying surface of a dryer or the like comprises an upstanding chute having strip-form material deposited thereinto in overlapping longitudinally pleated layers, means forming an arcuately extending shaft receiving layers from the chute with opposite edges of the layers abutting radially spaced, arcuately shaped inner and outer wall portions defining the shaft, and transfer means directing layers of the strip-form material to a substantially horizontally disposed conveying surface. A drum or wheel member having a cylindrical peripheral surface forms the shaft inner wall and is rotated to impart a desired circumferential velocity thereto, and an arcuately extending run or path of a continuous conveyor belt forms the radially spaced outer wall and is driven in a manner to impart a circumferential velocity thereto in excess of that of the inner wall, thereby turning or flipping the overlapped layers of the strip-form material so that leading layers overlap or overlie adjacent trailing layers as the material is transferred onto the conveying surface.

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**3,599,854**

**PRESSURE-FLUID-OPERATED TOOL**

**Neville Barry Pearson, Hornchurch, England, assignor to Samuel Montague Rose, Glasgow, Great Britain, a part interest**

**Filed Jan. 13, 1969, Ser. No. 790,589**

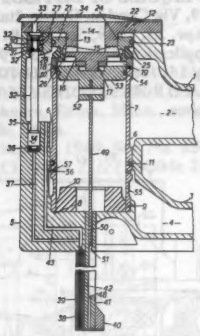
**Claims priority, application Great Britain, Apr. 9, 1968, Jan. 18, 1969, 289/68;16,901/68**

**Int. Cl. B27f *7/06***

**U.S. Cl. 227—7** **2 Claims**

A pressure-fluid-operated tool has between a pressure source and a pressure-operated valve for releasing pressure

to operate a driver, communication via a chamber which is formed within a gastight seal on the tool and between the



tool and the workpiece surface only when the tool is properly applied to the workpiece surface.

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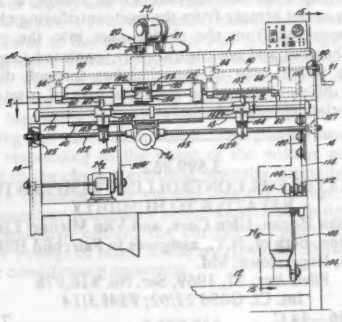
**3,599,855**
**BOX-STITCHING APPARATUS**
**Edward V. Henc, 302 Netherington Drive, Broomall, Pa.**
**Filed Mar. 13, 1969, Ser. No. 806,817**
**Int. Cl. B27f** *7/06*
**U.S. Cl. 227—7** **30 Claims**



Stitching apparatus comprising a main frame, a stitching head assembly mounted on the frame at a stitching station operable to apply stitches to the overlapping portions of sheet material, actuating means operating at a predetermined continuous rate of speed for advancing the sheet material through the stitching station and means for selectively varying the spacing between adjacent stitches.

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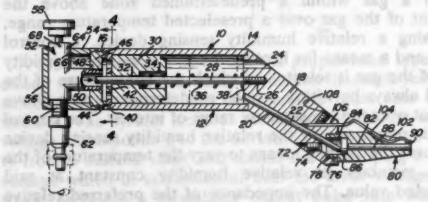
**3,599,856**
**OFFSET HEAD RIVETING GUN**
**James E. Eads, 1000 W. Allen, Bloomington, Ind.**
**Filed Feb. 25, 1970, Ser. No. 14,006**
**Int. Cl. B25d** *9/12*
**U.S. Cl. 227—149** **9 Claims**



An elongated cylinder body including front and rear ends and having a piston reciprocally disposed therein and an elongated angulated extension on its forward end whose free end terminates in a reversely angulated elongated guide structure generally paralleling the cylinder body. A reciprocal follower is supported from the guide structure for guided movement therealong and includes a rearwardly facing abutment surface while the piston includes a forwardly facing abutment surface. An elongated impact member is reciprocally supported from the extension for longitudinal reciprocation relative thereto and its opposite ends are disposed for contact with the forwardly facing abutment surface of the piston and the rearwardly facing abutment surface of the follower whereby forward impact of the piston with the impact member will cause forward shifting of the follower.

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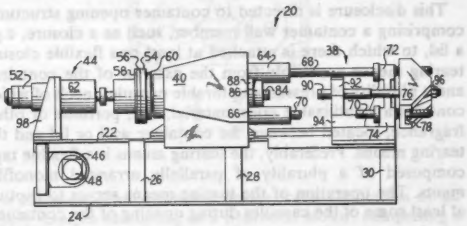
**3,599,857**
**WIDE RANGE FRICTION WELDER**
**Calvin D. Loyd, Peoria; Theodore L. Oberle, Washington; Ira H. Sage, Peoria, and Ronald L. Satzler, Metamora, all of, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.**
**Filed Apr. 25, 1969, Ser. No. 819,291**
**Int. Cl. B23k** *27/00*
**U.S. Cl. 228—2** **14 Claims**



A friction welding machine is adapted to weld workpieces having a wide range of diameters by utilizing a unidirectional drive means, such as a one-way overrunning clutch, which is disposed between rotatable components of the machine and a rotatable workpiece holding spindle. The unidirectional drive means provides a driving connection between the rotatable components and the spindle when relative motion therebetween is in one direction and prevents a driving connection when relative motion therebetween is in an opposite direction. One embodiment of the invention has a dual-spindle arrangement in which the spindles may be operated independently or together to provide a machine which is capable of friction welding workpieces having a large range of diameters. The dual-spindle arrangement also permits workpieces of relatively large diameter to be loaded and unloaded from the machine while the input energy components of the machine are being accelerated to welding velocity.

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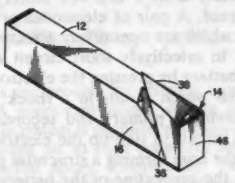
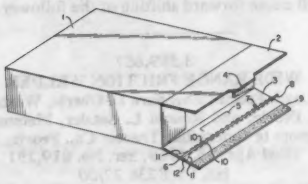
**3,599,858**
**PINCH-OPENING CONTAINER**
**Rolf A. Samsing, Braintree, Mass., assignor to The Gillette Company, Boston, Mass.**
**Filed June 11, 1969, Ser. No. 832,312**
**Int. Cl. B65d** *5/54, 17/04*
**U.S. Cl. 229—51 R** **8 Claims**



A container formed from a unitary blank and adapted to be opened by pressure applied to the container in a pinching manner.

**3,599,859**
**ARTICLES AND METHOD**
**Theodore Maierson, Dayton, Ohio, assignor to The National Cash Register Company, Dayton, Ohio**
**Filed Nov. 24, 1969, Ser. No. 879,039**
**Int. Cl. B65d** *5/54, 27/38*
**U.S. Cl. 229—51 AS** **12 Claims**



This disclosure is directed to container opening structures comprising a container wall member, such as a closure, e.g., a lid, to which there is attached at least one flexible closure tearing means accessible from the exterior of the container and a plurality of pressure-rupturable capsules, each of which contains a volatilizable core material, e.g., perfume or other fragrance, located between the container wall or lid and the tearing means. Preferably, the tearing means is a flexible tape composed of a plurality of parallelly arranged monofilaments. The operation of the tearing means serves to rupture at least some of the capsules during opening of the container.

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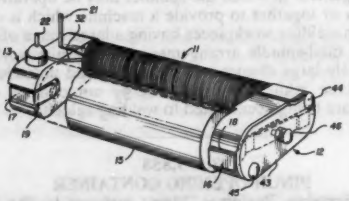
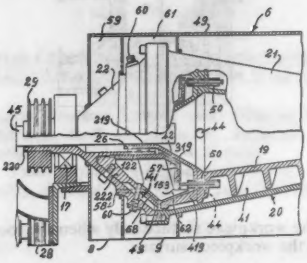
**3,599,860**
**BATTERY-POWERED SHOCK DEVICE**
**James E. Huwaldt, 14470 E. 13th Ave. C-46, Aurora, Colo.**
**Filed June 16, 1969, Ser. No. 833,481**
**Int. Cl. B65b** *11/00*
**U.S. Cl. 231—2** **12 Claims**



An electric shock device with a yoke-shaped support member conformable to fit within the palm of the hand is arranged to releasably hold a dry cell battery between the spaced arms thereof. A pair of electrodes project from the support member which are operatively associated in a circuit with the battery to selectively short circuit electric energy provided by the battery by pressing the electrodes against the body of an animal which results in a shock. An elongated magnetic core having a primary and secondary winding is connected in the circuit to step up the electric voltage from the battery with the core forming a structural part of the support member for the supporting of the battery in place. One of a pair of vibrator contacts connected in the circuit is magnetically associated with the core to alternately open and close the circuit to induce the electric energy from the primary winding into the secondary winding.

**3,599,861**
**CENTRIFUGE FOR SEPARATION OF MIXTURES OF SOLIDS AND LIQUIDS OF DIFFERENT WEIGHT**
**Mario DeMartini, 9, Via Corsica, Genoa, Italy**
**Filed Apr. 23, 1969, Ser. No. 818,550**
**Claims priority, application Italy, May 3, 1968, May 7, 1968, May 14, 1968, 6996;7004;7025**
**Int. Cl. B04b** *3/00, 1/00, 11/00*
**U.S. Cl. 233—2** **17 Claims**



A centrifuge for separating mixtures consisting of solids and at least one liquid comprises a rotatable drum formed by two opposed hollow cones in one of which a hollow worm is coaxial and rotatable relative to the drum. The worm forms with the conical portions of the drum a precentrifuging chamber which communicates with a postcentrifuging chamber and mixture fed into the worm passes into the precentrifuging chamber so that solids sludge is fed out through an outlet remote from the postcentrifuging chamber. Liquids separated from the sludge pass into the postcentrifuging chamber and are centrifugally separated to pass, according to weight, out of the chamber through ducts arranged at different distances from the axis of rotation and through outlets appropriate thereto.

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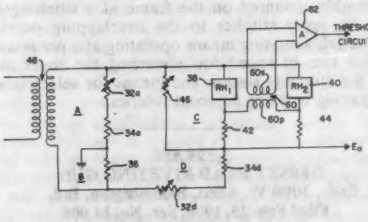
**3,599,862**
**APPARATUS FOR CONTROLLING TEMPERATURE RELATIVE TO HUMIDITY**
**William John Hogan, Glen Cove, and Vito Michael Liantonio, Douglaston, both of, N.Y., assignors to Fairchild Hiller Corporation, Hagerstown, Md.**
**Filed Apr. 17, 1969, Ser. No. 816,978**
**Int. Cl. G05d** *22/02;* **F24f** *3/14*
**U.S. Cl. 236—44 C** **7 Claims**




Dewpoint control apparatus for maintaining the temperature of a gas within a predetermined zone above the dewpoint of the gas over a preselected temperature range, comprising a relative humidity sensing device, a control means, and a means for heating the gas. A relative humidity value of the gas is selected at which the temperature of the gas will always be within a small predetermined zone above dewpoint over the temperature range of interest. The control means is responsive to the relative humidity sensing device and causes the heating means to vary the temperature of the gas to maintain its relative humidity constant at said preselected value. The impedance of the preferred relative humidity sensing device changes as a function of temperature as well as relative humidity. Accordingly, a bridge circuit incorporating a plurality of thermistors is provided to compen-

sate for such impedance changes by nulling the effect of temperature on the impedance of said relative humidity sensing device.

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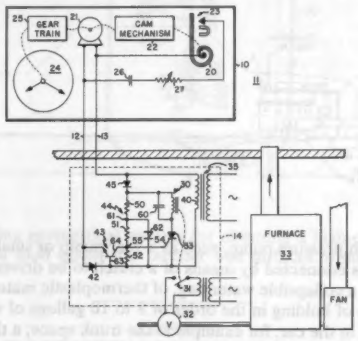
**3,599,863**

## ELECTRIC CLOCK THERMOSTAT HAVING PHASE RESPONSIVE CONTROL APPARATUS

**Balthasar H. Pinckaers, Edina, Minn., assignor to Honeywell Inc., Minneapolis, Minn.**

**Filed Sept. 8, 1969, Ser. No. 856,062**
**Int. Cl. G05d** *23/275;* **G04c** *23/00*
**U.S. Cl. 236—46** **4 Claims**




A power supply and phase-responsive apparatus connected by two wires to a remote electric clock thermostat for supplying power to the clock motor and connecting a temperature-responsive switch apparatus in the thermostat over the same two wires to a relay associated with the phase-responsive apparatus for controlling temperature-conditioning apparatus furnishing heated air from a furnace to the space containing the clock thermostat. The phase-responsive apparatus responding to the phase of the voltage and current supplied to the clock thermostat whereby normally with only the clock operating, the current lags the voltage, but upon the temperature-responsive switch apparatus closing an additional capacitive circuit, the current is either in phase or leads the voltage to result in the energization of the relay and thus the conditioning apparatus.

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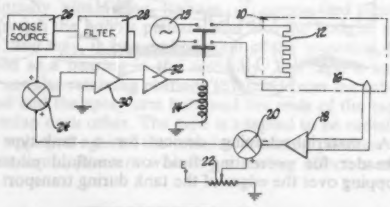
**3,599,864**

## CONTROL SYSTEM WITH VARIABLE PULSE RATE

**David E. Liddle, Toledo, Ohio, assignor to Permaglass Inc., Millbury, Ohio**

**Filed Sept. 29, 1969, Ser. No. 861,803**
**Int. Cl. G05b** *11/30;* **G05d** *23/22*
**U.S. Cl. 236—78** **10 Claims**




A feedback control system of the proportional type is disclosed wherein a pulse width modulator is employed which exhibits both variable gain and variable pulse rate characteristics. The system includes means for producing an error voltage corresponding to the deviation of the variable quantity from a desired value and means for developing a carrier voltage which in combination with the error voltage effectively produces a modulator output pulse rate which increases as the error voltage decreases. The carrier voltage may be derived from a gaussian random noise source or may be developed by a variable frequency oscillator. The system is especially adapted for use where the control device includes a mechanical contactor wherein it is desired to limit the cycling of the contactor and still obtain the desired degree of control. A typical application is in temperature control systems for glass-treating furnaces

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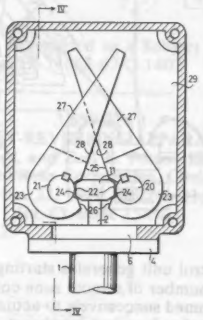
**3,599,865**

## THERMOHYDRAULIC CONTROL DEVICE

**Svend Helge Kristiansen, Naestved, Denmark, assignor to Nordisk Ventilator Co/ A/S, Naestved, Denmark**

**Filed Aug. 8, 1969, Ser. No. 848,455**
**Claims priority, application Denmark, Aug. 14, 1968, Mar. 6, 1969, 3,923/68;1,254/69**
**Int. Cl. F24f** *13/08*
**U.S. Cl. 236—99** **7 Claims**



A thermohydraulic control device for a ventilation or air supply damper consisting of a hydraulic motor, comprising a cylinder in which a plunger piston is movably disposed, the volume of the cylinder being of such a size relative to its cross-sectional area that the cylinder can at the same time act as a temperature-responsive element, the piston pin of the plunger piston being coupled to the damper shaft by means of a single-toothed rack and pinion wheel connection having engagement surfaces which lock the damper in the open or the closed position, respectively, when the tooth of the rack is out of engagement with the single tooth-space of the tooth wheel.

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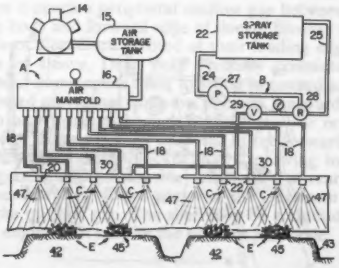
**3,599,866**

## ATOMIZING SPRAY PROCESS AND APPARATUS

**Jack C. Bolton, Salinas, Calif., assignor to Soilserv, Inc., Salinas, Calif.**

**Filed Aug. 21, 1968, Ser. No. 754,436**
**Int. Cl. A01n** *17/02*
**U.S. Cl. 239—8** **5 Claims**



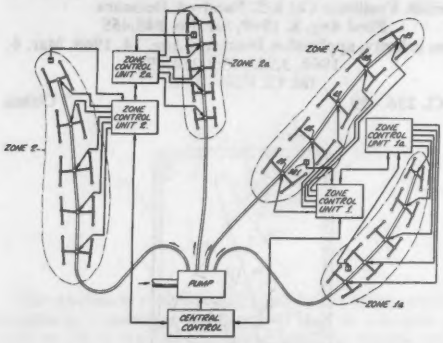

An apparatus and process for spraying crops with atomized liquid spray. A supported nozzle system is passed over a crop. The nozzle system is supplied with liquid spray preparation and atomizing air at high pressures and is oriented to discharge atomized spray downwardly. The high-pressure atomizing air produces a turbulent cloud which displaces the ambient atmosphere adjacent the sprayed crop, effects dilution of the spray preparation without diminishing spray effectiveness, and penetrates the foliage undersides to coat the entire plant with spray.

**3,599,867**

## MODULAR IRRIGATION CONTROL SYSTEM

David E. Griswold, Corona Del Mar, and Jonathan D. Likins, Costa Mesa, both of, Calif., assignors to Griswold Controls, Santa Ana, Calif.

Filed Nov. 12, 1969, Ser. No. 875,658
Int. Cl. A01g *25/00*
U.S. Cl. 239—63 16 Claims




A central control unit generates starting signals which are distributed to a number of remote zone control units, each of which is programmed successively to actuate selected ones of a respective set of valves in accordance with a preselected schedule. A chain of zone control units may be triggered in succession, each by a signal from the preceding such unit, to carry out its assigned schedule when the schedule assigned to the preceding zone control unit has been completed.

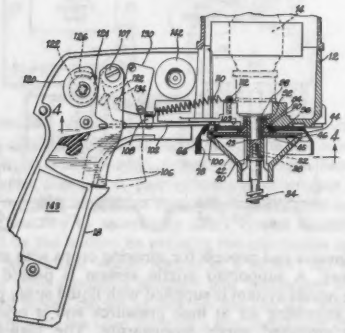
Both the central and the zone control units are made to respond automatically and positively to various events such as a power failure, rain, excessive ground moisture, and the actuation of the valves. A simple method of sending signals in both directions between a central control unit and a zone control unit over a single pair of wires is also provided to actuate the system components remotely.

**3,599,868**

## ROTARY SPRAY GUN

Ernest C. Rangus, Lombard, and Suppayan M. Krishnakumar, Chicago, both of, Ill., assignors to Electro Engineering Products Co., Inc.

Filed Dec. 29, 1969, Ser. No. 888,616
Int. Cl. B05b *3/02*
U.S. Cl. 239—218.5 10 Claims



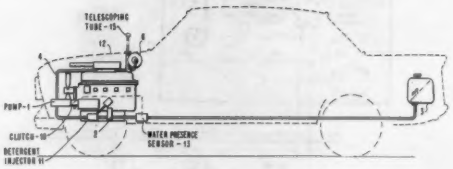
A rotary spray gun having a trigger operated motor and gating mechanism, the motor being energized prior to opening of the gating mechanism, the gating mechanism thereafter being automatically opened to a preselected amount, thereby to discharge a predetermined width of spray pattern with minimal formation of droplets.

**3,599,869**

## CAR WASHING APPARATUS ADAPTED FOR MOUNTING ON THE VEHICLE TO BE WASHED

Guido Oberdorfer, Werkstrasse 22, Bellenberg, Germany

Filed Mar. 3, 1969, Ser. No. 803,787
Int. Cl. E01c *19/16*
U.S. Cl. 239—172 5 Claims



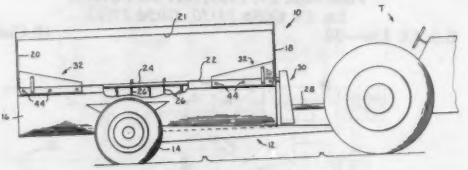

A high pressure pump, such as a gear pump or small piston pump, is connected by means of a clutch to be driven by the engine; a collapsible water bag, of thermoplastic material and capable of holding in the order of 8 to 10 gallons of water, is located in the car, for example in the trunk space; a thin flexible tubing is spooled on a reel, located in the car (for example under the hood), and hydraulic interconnections are provided to take water from the water bag through the pump and to the tubing, so that a self-contained car washing system is provided capable of applying a water stream under pressure. When not in use, the plastic water bag is collapsed, and can fold flat against the inner wall of the trunk.

**3,599,870**

## LIQUID MANURE RETAINER

Warren H. Brackbill, Paradise, and Ernest E. Buck, New Holland, both of, Pa., assignors to Sperry Rand Corporation, New Holland, Pa.

Filed Oct. 3, 1969, Ser. No. 863,458
Int. Cl. F23d *11/04*
U.S. Cl. 239—220 8 Claims



A material-retaining device for a tank-type manure spreader for preventing fluid or semifluid material from slopping over the edges of the tank during transport.

**3,599,871**

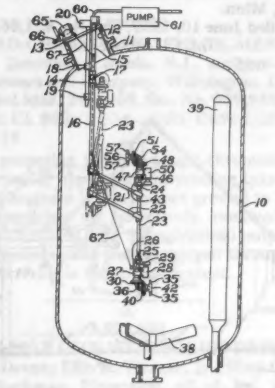
## JET SPRAY TANK CLEANER

Donald B. Ruppel, Cuyahoga Falls; Norman E. Reinhart, Cuyahoga Falls, Ohio, and Lee F. Stalker, Louisville, Ky., assignors to The B. F. Goodrich Company, New York, N.Y.

Filed July 8, 1969, Ser. No. 839,896
Int. Cl. B05b *3/10*
U.S. Cl. 239—227 9 Claims

A portable high-pressure jet spray cleaning apparatus with collapsible features for use in cleaning the agitator blades

and the interior surfaces of tanks and vessels utilizing a plurality of rotatable high-pressure spray nozzles which rotate in




a changing geometrical pattern for directing a high-pressure stream of fluid against the interior wall surfaces of tanks and vessels.

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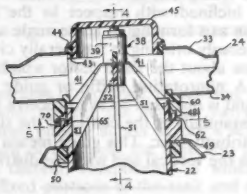
**3,599,872**

**SEALING MEANS IN A ROTATING SPRAY DEVICE**

**Lauren W. Guth, Louisville, Ky., assignor to General Electric Company**

**Filed Aug. 14, 1969, Ser. No. 850,069**
**Int. Cl. F16j** *15/34, 15/54*
**U.S. Cl. 239—261** **10 Claims**



A ribbonlike flexible strip or tape formed from a highly durable abrasion-resistant material having a low surface friction characteristic, such as is obtainable from nylon or fluorocarbon resin, is used to obtain a seal between a stationary tubular pedestal and a spray arm mounted for rotation thereon. The seal obtained therewith serves the purpose of substantially eliminating leakage of pressurized liquid passing through the hollow pedestal and into the body of the spray arm, and may, in one embodiment of the invention, be also utilized as a bearing in the assembly. The tape is supported by annular retaining portions extended from the tubular pedestal and the spray arm hub, and the ends of the tape loosely overlap each other. The tape is adapted to be radially outwardly enlarged against the annular retaining portions in response to liquid pressure whereby a sealing effect is obtained.

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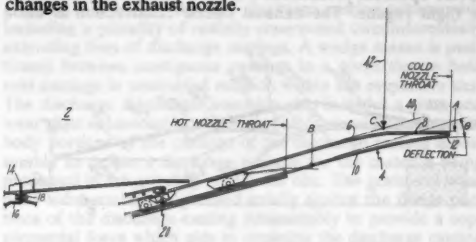
**3,599,873**

**VARIABLE AREA EXHAUST NOZZLE CONSTRUCTION**

**Norman A. Williams, Stafford Springs, Conn., assignor to United Aircraft Corporation, East Hartford, Conn.**

**Filed Sept. 15, 1969, Ser. No. 857,976**
**Int. Cl. B64c** *9/38*
**U.S. Cl. 239—265.39** **2 Claims**

A variable area exhaust nozzle for a gas turbine engine, in particular, an iris-type flap nozzle for use with a gas turbine engine, wherein the flap tips of the iris nozzle are preloaded compressively to prevent and avoid any subsequent area changes in the exhaust nozzle.




This application is reported as a Subject Invention under Government contract F-33657-67-C-1402.

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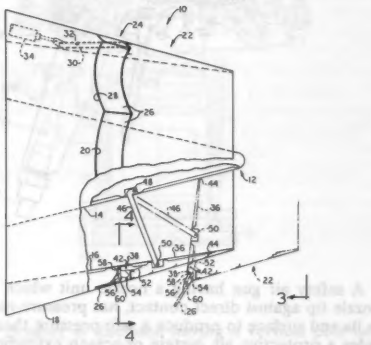
**3,599,874**

**THRUST-REVERSING APPARATUS**

**Felix Hom, La Mesa, and Earl B. Potter, El Cajon, both of, Calif., assignors to Rohr Corporation, Chula Vista, Calif.**

**Filed Mar. 23, 1970, Ser. No. 21,881**
**Int. Cl. B64c** *15/04*
**U.S. Cl. 239—265.29** **8 Claims**



Apparatus comprises elongate shell coaxial with engine, extending rearwardly and open at aft end, to surround and control jet stream. Aft portion of shell is a sleeve slidably mounted to main body of shell for fore and aft translation. In forward position it is a streamline continuation of the shell. In aft position it opens a peripheral outflow gap between rear edge of main body and forward edge of sleeve. Blocker doors around inside of sleeve are pivoted at their leading edges to leading edge of sleeve. Drag links pivotally connected to center body and doors cause them to swing in toward axis of shell on rearward movement of sleeve to block rearward flow of jet stream and force it through outflow gap for reverse thrust. Deflector doors pivotally mounted at the forward end of the sleeve are linked to blocker doors to swing to forwardly divergent attitude when sleeve is moved to rearward position to increase the forward vector of the jet stream issuing through the outflow gap. The shell may be a shroud surrounding the engine or it may be the primary jet nozzle.

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**3,599,875**

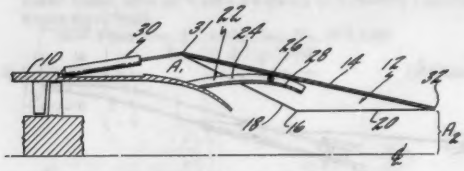
**TRANSLATING AIR SCOOP EJECTOR NOZZLE**

**Thomas A. Wynosky, Hazardville, and Walter L. Blackmore, Wethersfield, both of, Conn., assignors to United Aircraft Corporation, East Hartford, Conn.**

**Filed Feb. 10, 1969, Ser. No. 797,807**
**Int. Cl. B64c** *15/06*
**U.S. Cl. 239—265.41** **10 Claims**

An exhaust nozzle of the ejector type which operates over the entire flight regime of a gas turbine powered aircraft to

provide optimum performance at each and every point over the flight regime. The exhaust nozzle construction is also



capable of function as a thrust reverser while providing improved noise suppression characteristics.

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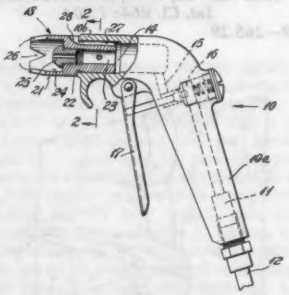
**3,599,876**
**SAFETY AIR GUN**
**Henry E. Kyburg, 526 Beach Road, Fairfield, Conn.**
**Filed June 17, 1969, Ser. No. 834,128**
**Int. Cl. B05b *1/28***
**U.S. Cl. 239—291** **1 Claim**



A safety air gun having a nozzle unit which protects the nozzle tip against direct contact, has pressure-reducing vents in its end surface to produce a safe pressure thereat and provides a protective air curtain or screen extending therefrom to protect against flyback.

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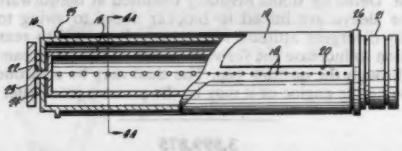
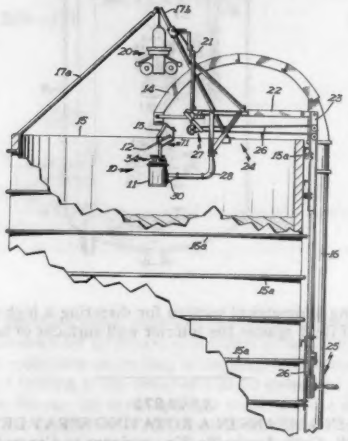
**3,599,877**
**NOZZLE ARRANGEMENT FOR FORMING FLUID WAVE**
**Sandor Goldschmied, Anaheim, Calif., assignor to Burroughs Corporation, Detroit, Mich.**
**Division of Ser. No. 595,137, Nov. 17, 1966, Pat. No. 3,500,536.**
**Filed July 2, 1969, Ser. No. 870,822**
**Int. Cl. B05b *1/20***
**U.S. Cl. 239—562** **12 Claims**



A nozzle arrangement comprising concentric inner and outer cylinders and a jacket fitting tightly around the outer cylinder. The inner and outer cylinders have longitudinal fluid exits and are relatively rotatable. A knob located outside the outer cylinder is connected by a shaft to the inner cylinder to permit it to be rotatably adjusted relative to the outer cylinder. The jacket has an elongated slot that serves to regulate the flow through the exit of the outer cylinder.

**3,599,878**
**DISTRIBUTOR APPARATUS**
**Floyd E. Buschbom, Long Lake, and Glen D. Hansen, Maple Plain, both of, Minn., assignors to Van Dale Corporation, Long Lake, Minn.**
**Filed June 10, 1969, Ser. No. 831,862**
**Int. Cl. A01c *17/00***
**U.S. Cl. 239—665** **25 Claims**



A distributor apparatus for distributing particulate material such as ensilage in a storage container such as a silo. The distributor is movable toward and away from the center of the silo on a fixed track. The distributor includes a distributor disc which is inclined with respect to the horizontal and rotates about an axis forming an acute angle with the vertical while simultaneously orbiting in a generally circular path in a horizontal plane about the fixed motor which drives the distributor disc. A nonrotating baffle or guide member orbits with the disc and is disposed so as to receive material from a gooseneck substantially at the center of the silo and to direct it onto the distributor disc. This guide means forms an acute angle with both the vertical and with the distributor disc.

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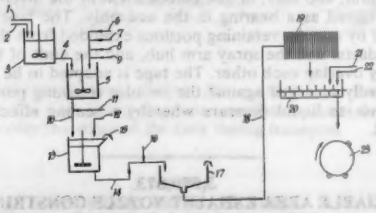
**3,599,879**
**GRINDING TREATMENT OF CLAY**
**Norman Owen Clark, Cornwall, England, assignor to English Clays Lovering Pochin & Company Limited, Cornwall, England**
**Continuation-in-part of application Ser. No. 732,386, May 27, 1968, now abandoned. This application Feb. 17, 1970, Ser. No. 12,139**
**Int. Cl. B02c *17/04, 21/00, 23/06***
**U.S. Cl. 241—4** **6 Claims**



A forth flotation process for the removal of mineral impurities from a crude clay wherein the flotation reagents are removed from the purified clay particles by agitation of a slurry of the clay with a particulate grinding material consisting of particles of a size in the range from one-half inch to 100 mesh B. S. sieve. The weight ratio of particulate grinding

material to clay is in the range 2:1 to 5:1, and the agitation is continued for a time sufficient to dissipate in the slurry at least 100 horsepower hours of energy per long ton of clay.

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3,599,880

## LEAD-CHROMATE-BASED PIGMENT

Alexander M. Janowski, Colonia, N.J., assignor to E. I du Pont, de Nemours and Company, Wilmington, Del.

Filed Mar. 24, 1969, Ser. No. 809,959
Int. Cl. B02c *13/24*, *13/00*; C09c *1/20*
U.S. Cl. 241—19 2 Claims

Method of preparing improved lead-chromate-based pigments, for particular application in printing inks and paints, in which lead chromate is first impact ground to pulverize it, the oversize particles are selectively removed from the product and recirculated, and the pulverized output is further subjected to disintegration and discharged through a classification means to result in improved pigment.

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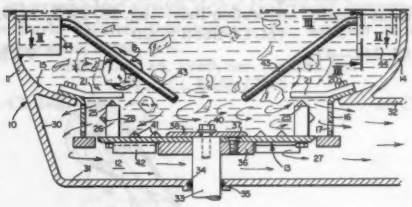
3,599,881

## PULPING APPARATUS WITH SOLIDS DEFLECTOR

Sam N. Craig, Devon; Ellis R. Warner, Jr., West Chester, and Wayne T. Buckman, Pipersville, all of, Pa., assignors to Wascon Systems, Incorporated, Hatboro, Pa.

Filed Sept. 30, 1968, Ser. No. 763,620
Int. Cl. B02c *18/12*
U.S. Cl. 241—46.06 13 Claims



A pulping apparatus is provided, comprising a tank having a rotatable impeller therein, the impeller carrying vanes for providing a desired pulsing action across a screen or sizing ring at the bottom of the tank, the tank also having cutting means disposed therein, components of which are carried respectively on fixed portions of the tank and on the rotatable impeller, and wherein structure is provided for deflecting large solid particles toward the cutting means.

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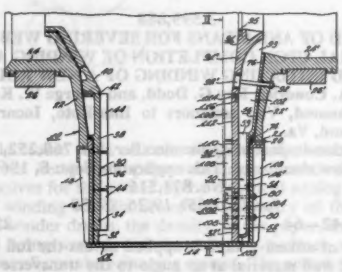
3,599,882

## DISCHARGE DIAPHRAGM ASSEMBLY FOR GRINDING MILL OR THE LIKE

Richard E. Sabaski, Hales Corners, and Roger A. Heins, Milwaukee, both of, Wis., assignors to Allis-Chalmers Manufacturing Company, Milwaukee, Wis.

Filed Jan. 8, 1970, Ser. No. 1,442
Int. Cl. B02c *17/18*
U.S. Cl. 241—70 14 Claims



A discharge diaphragm assembly for a rotary grinding mill or the like comprising a discharge casting subassembly adapted to be mounted inside the discharge end of a rotary grinding mill or the like, the discharge casting subassembly including a plurality of radially superposed circumferentially extending tiers of discharge castings. A wedge means is positioned between contiguous castings in a given tier to hold said castings in assembled relation within the respective tier. The discharge diaphragm assembly also includes a grate and wear plate subassembly which is axially spaced from the main body portions of the castings of the discharge casting subassembly to define a discharge passage for the material being processed in the grinding mill or the like. The grate and wear plate subassembly is tightened axially against the flange portions of the discharge casting subassembly to provide a supplemental force which aids in retaining the discharge casting subassembly properly positioned.

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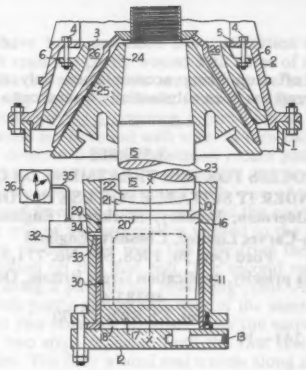
3,599,883

## GYRATORY CRUSHER WITH SETTING INDICATOR

Robert J. Pollak, Milwaukee, Wis., assignor to Allis-Chalmers, Milwaukee, Wis.

Filed Nov. 19, 1969, Ser. No. 877,966
Int. Cl. B02c *2/06*
U.S. Cl. 241—213 8 Claims



A gyratory crusher is disclosed having a vertical post assembly with a crushing head mounted on top, and the post assembly is slidably supported in a lower frame. An overhanging concave ring is supported in a fixed position around the crushing head by an upper frame. The post assembly includes a hydraulically operated piston for raising and lowering the crushing head relative to the concave ring and the lower frame includes a cylinder supporting the piston. The piston has a downwardly pointed taper defining a cam surface. A linear variable differential transformer is connected to the cylinder and has a movable core which is slidably biased to horizontally project through the cylinder and engage the cam surface of the piston to move inwardly upon upward movement of the piston and be pushed outwardly by the cam surface upon downward movement of the piston. The movement of the core provides an electrical output signal that indicates the position of the crushing head carried by the piston, relative to the concave ring.

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3,599,884

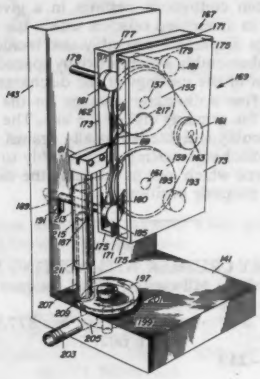
## COIL WINDER

John E. Tillman, Albuquerque, N. Mex., assignor to Leesona Corporation, Warwick, R.I.

Filed Dec. 31, 1968, Ser. No. 788,134
Int. Cl. H01f *41/08*; B65h *81/02*
U.S. Cl. 242—4 5 Claims

Apparatus for winding a strand about a core. A pair of spaced rotatable elements are provided on which sufficient strand is wound to completely wind the core. Mechanism is provided for driving the rotatable elements to deliver the strand to be wound on a suitably supported core. Means is

provided for sequentially and automatically picking off the wraps of strand wound off the rotatable elements, each



picking off step being accomplished only after the prior strand wrap has been substantially wound onto the core.

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**3,599,885**

**PROCESS FOR THE TREATMENT OF COAL TO RENDER IT SUITABLE FOR USE IN COKE OVEN**

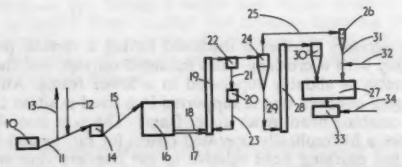
**Lewis Alderman, Romiley, Stockport, England, assignor to Simon-Carves Limited, Cheshire, England**

**Filed Oct. 30, 1968, Ser. No. 771,934**

**Claims priority, application Great Britain, Oct. 31, 1969, 49383/67**

**Int. Cl. B02c** *21/00*

**U.S. Cl. 241—17** **4 Claims**



The treatment of coal which is of a size, or which is crushed to a size not greater than 1 inch by drying and heating the coal and separating the relatively fine coal dust therefrom before delivering the coal and the coal dust mixed with oil to a surge bin.

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**3,599,886**

**AUTOMATIC WINDER**

**Emil Koller, Wadenswil, Switzerland, assignor to Machinenfabrik Schweiter AG., Horgen, Switzerland**

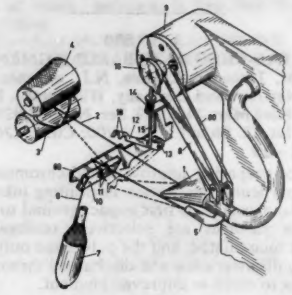
**Filed July 9, 1969, Ser. No. 840,383**

**Claims priority, application Switzerland, July 18, 1968, 10741/68**

**Int. Cl. B65h** *54/22*

**U.S. Cl. 242—35.5 R** **13 Claims**

A winding machine for yarn or thread is disclosed which senses a break in the yarn, juxtaposes the broken ends of the yarn and insures that the broken ends are properly presented to a suitable yarn defect correcting mechanism. A reciprocating suction head means draws the broken ends of the yarn into the yarn defect correcting mechanism. According to an important aspect of the invention mechanism is provided for



determining that the broken yarn ends are capable of being properly fed to the yarn defect correcting mechanism.

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**3,599,887**

**HOLDER FOR FLEXIBLE CONDUCTORS FOR DENTIST'S TOOLS**

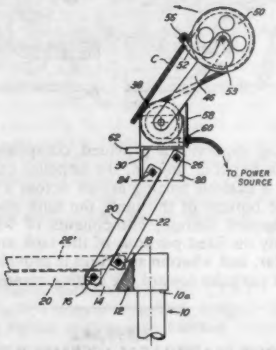
**Emilio Marverna, Monticello Brianza, Como, Italy**

**Filed Aug. 6, 1969, Ser. No. 847,993**

**Claims priority, application Italy, Aug. 28, 1968, 20495**

**Int. Cl. B65h** *51/20*

**U.S. Cl. 242—47.5** **9 Claims**




A device is disclosed comprising a swinging arm presenting at its fix and movable end two pulleys onto which winds, with greater or smaller amplitude, a flexible conductor connecting the considered tool to the energy source and thus varying the distance of said tool from the energy source.

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**3,599,888**

**METHOD OF AND MEANS FOR SEVERING WEB STRIP MATERIAL UPON COMPLETION OF WINDING A ROLL AND INITIATING WINDING OF A NEW ROLL**

**Edward A. Coudriet; Roy G. Dodd, and George W. Kesler, all of Richmond, Va., assignors to Inta-Roto, Incorporated, Richmond, Va.**

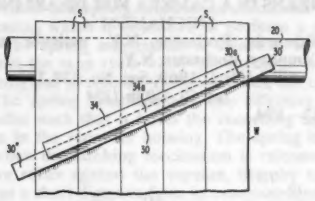
**Continuation-in-part of application Ser. No. 768,252, Oct. 17, 1968, now abandoned. This application Sept. 8, 1969, Ser. No. 871,516**

**Int. Cl. B65h** *19/26, 19/28*

**U.S. Cl. 242—64** **22 Claims**

A strip of adhesive tape is applied across the full width of elongated web material at an angle to the transverse thereof, and the leading end of said tape is adhered to a new winding mandrel. As the web is moved past the mandrel, it is torn along the leading edge of the tape to finish a wound roll, and

the tape-adhered-severed edge is wound on the new mandrel to initiate a new roll. A second tape may be applied to the web in overlapping relation to the leading edge of the first-mentioned tape so that an adhesive portion of said second



tape is exposed as the web is severed and serves to secure the trailing end of the severed web on the completed wound roll. For very wide web material, tapes may be applied to the mandrel at both sides of the web and meet at an apex at the center of the web.

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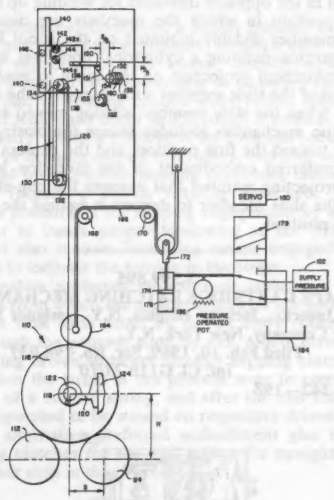
**3,599,889**

## ELECTRONIC RIDER ROLL CONTROL SYSTEM

**John David Pfeiffer, Downingtown, Pa., assignor to Beloit Corporation, Beloit, Wis.**

**Filed Dec. 16, 1969, Ser. No. 885,504**
**Int. Cl. B65h *17/08***
**U.S. Cl. 242—66** **26 Claims**



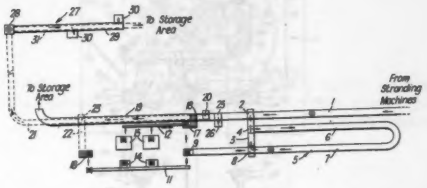

An electronic rider roll control system for controlling the nip forces between a paper-winding roll and the winder drums solves for the actual nip by electrical analog as a function of winding roll diameter, the geometry of the winding roll and winder drums, the density, of the paper, the width of the roll being wound, and the relieving pressure applied by the rider roll counterbalancing system. The actual nip is compared with the desired nip as determined by a nip set point controller and is controlled accordingly. The starting nip and nip slope may also be simply controlled.

**3,599,890**

## METHOD OF AND APPARATUS FOR SELECTIVELY SORTING EMPTY AND PARTLY WOUND REELS

**James Atherton, Wrexham, Wales, and David Sydney Goodfellow, Shrewsbury, England, assignors to British Insulated Callender's Cables Limited, London, England**

**Filed Aug. 5, 1969, Ser. No. 847,614**
**Claims priority, applicati n Great Britain, Aug. 7, 1968, 37710/68**
**Int. Cl. B21c *47/24*; B65h *54/00***
**U.S. Cl. 242—79** **11 Claims**




Reels that have been unloaded from utilization stations, some of which reels are partly wound with wires of different kinds and some of which reels are empty, are selectively sorted by causing the reels to travel from the utilization stations in succession along a common return path to plant at which empty reels are rewound with wire. In turn each partly wound reel is diverted from the common return path and is circulated around and stored temporarily in an endless storage path. Two reels partly wound with wire of the same kind are removed from the storage path and the exposed end of the wire on one of the two reels is welded to the exposed end of the wire on the other reel. The wire from the second reel is then wound on the first reel. The second reel when empty travels along a path to the rewinding plant. As necessary further reels partly wound with wire of the same kind as that of the first two reels are removed from the storage path and the latter two steps repeated until the first reel is fully wound with wire. The fully wound reel travels along a path to a storage area.

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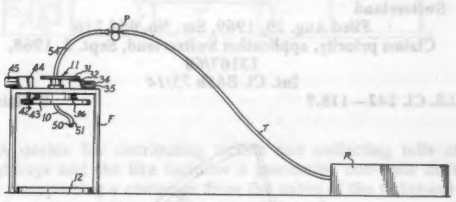
**3,599,891**

## COILER

**Kenneth Ray Stone, Newnan, Ga., assignor to Southwire Company, Carrollton, Ga.**

**Filed Nov. 6, 1968, Ser. No. 773,792**
**Int. Cl. B21c *47/02*; B21f *3/08***
**U.S. Cl. 242—82** **12 Claims**



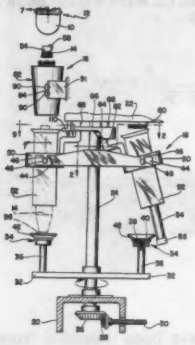
A coiler for coiling a metal rod or the like and that includes a flyer tube and a motion control means which includes a first driving means for rotating the flyer tube about an axis of rotation along which the metal rod to be coiled is fed into the flyer tube and about which the discharge end of the flyer tube moves in a circle and a second driving means for moving the axis of rotation of the flyer tube in a conical plane of motion about a substantially vertical line of reference which becomes the centerline of the coil of metal rod formed by the coiler.

3,599,892

## BOBBIN SEATING AND REMOVING APPARATUS AND METHOD

Charles W. Brouwer, East Greenwich; Larry C. Cowan, Jamestown, and Robert Horton, Warwick, all of, R.I., assignors to Lessona Corporation, Warwick, R.I.

Filed June 30, 1969, Ser. No. 837,429
Int. Cl. B65h *49/02*; D03j *5/08*
U.S. Cl. 242—130 19 Claims



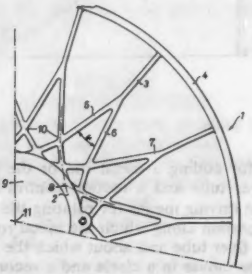
Apparatus for delivering filled bobbins to an indexing creel of a winding machine and removing empty bobbins from the creel. A bobbin is dropped through a device which slows the descent of the bobbin while effectively preventing any substantial scuffing of the yarn on the bobbin. The bobbin drops vertically into a creel tube and onto a magnetic seat. An iron or steel ring on the end of the bobbin core magnetically couples the bobbin and the seat. The creel tube is pivotally mounted to swing outwardly for ejecting an empty bobbin during subsequent indexing of the creel. However during receipt of the bobbin the tube is prevented from such pivotal movement to prevent improper seating or ejection of the bobbin. When the creel indexes to eject an empty bobbin the top end of the bobbin core is displaced laterally so that the iron ring is tilted on the magnetic seat for at least partially breaking the magnetic coupling, and then the creel tube is swung outwardly to slide the ring across the magnetic seat and eject the bobbin from the creel.

3,599,893

## WARP BEAM FLANGE

Martin Landolf, Lucerne; Rudolf Roth, Reinach; Paul Beuchi, Gontenschwil, and Peter Weber, Menziken, all of, Switzerland, assignors to Aluminium AG Menziken, Menziken, Switzerland

Filed Aug. 29, 1969, Ser. No. 854,116
Claims priority, application Switzerland, Sept. 2, 1968, 13167/68
Int. Cl. B65h *75/14*
U.S. Cl. 242—118.7 8 Claims



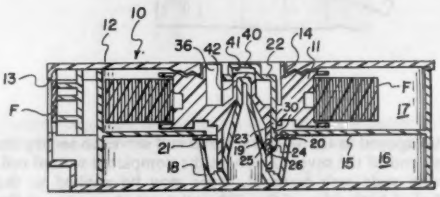
A novel warp beam flange is disclosed which is suitable for a substantially greater axial stressing when a warp beam is filled with yarn. This is possible by ribs extending radially in the outer region and tangentially in the vicinity of the hub and the ribs form branches.

3,599,894

## ANTIBACKUP MECHANISM IN A FILM CARTRIDGE, AND MEANS IN A CAMERA FOR DISABLING THE MECHANISM

Evan A. Edwards, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed July 1, 1969, Ser. No. 838,275
Int. Cl. G03b *1/04*
U.S. Cl. 242—194 5 Claims



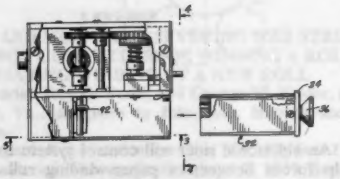
An antibackup mechanism for preventing reverse rotation of the takeup spool in a movie film cartridge, and means for disabling the antibackup mechanism in a camera adapted for driving the film in reverse for photographing "fade, lap and dissolve" sequences. In a preferred embodiment the mechanism is a ratchet coupling between the spool and the cartridge housing, comprising a first member mounted in the cartridge for movement transverse to the axis of rotation of the spool, and a second member slidably mounted on the spool for rotation therewith and for axial movement between a first position in which the members cooperate to prevent rotation of the spool in one direction and permit rotation of the spool in the opposite direction for winding up film, and a second position in which the members are disabled. The second member slidably mounted on the spool has a cup-shaped portion defining a cylindrical bore that slidably fits over a cylindrical projection on the spool to assure correct alignment of the slide member with respect to the spool, particularly when the slide member is being moved axially. The antibackup mechanism includes means for biasing the slide member toward the first position, and the camera according to the preferred embodiment of the invention is provided with a projecting member that engages the cup-shaped portion of the slide member to depress it against the bias to its disabled position.

3,599,895

## TAPE CARTRIDGE LATCHING MECHANISM

Gustav Janecka, Jackson Heights, N.Y., assignor to Neptune Meter Company, New York, N.Y.

Filed Feb. 10, 1969, Ser. No. 798,037
Int. Cl. G11b *23/10*
U.S. Cl. 242—198 4 Claims



A tape recorder, particularly for purposes of recording data, comprising a tape cartridge which is adapted to fit, in the manner of a drawer, into a compartment in a recorder housing. The recorder housing contains the required elements for magnetically recording the data. The tape cartridge

is latched into operating position within the compartment by a latching mechanism which includes the provision of spring loading for the brake and drive shafts of the recorder so that they may be readily retracted upon insertion and removal of the tape cartridge. The shafts are placed into driving relationship with the tape reels upon full insertion of the cartridge into its compartment.

Also provided is a spring mechanism contained within the cartridge casing which is operative to perform a number of functions. The spring mechanism is effective to operate a brake against the tape reels when the cartridge is out of its compartment, and to release the brake when the cartridge is inserted. The spring mechanism is also effective to bias a pressure roller such that it holds the recording tape against the capstan in the recorder housing. The spring mechanism also acts when the latching mechanism is released to force the pressure roller against the capstan, thereby to kick out the cartridge a short distance from its compartment.

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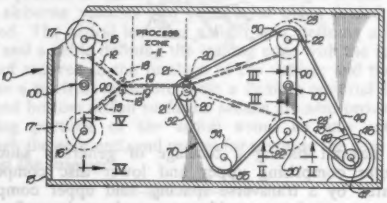
**3,599,896**

## DUPLICATION APPARATUS FOR CONTINUOUS STRIPS

**Sam Schwartz, Los Angeles, Calif., assignor to Extek Microsystems, Inc., Von Nuys, Calif.**

**Filed Jan. 8, 1970, Ser. No. 1,356**
**Int. Cl. B11b *15/32*; G03b *1/04***
**U.S. Cl. 242—208** **14 Claims**




In the preferred embodiment, a supply balance bar equalizes clutch pad engagement pressure, between each of a pair of housing supported supply spools, initially mounting a master and a second continuous strip to be pulled therefrom, between a pair of housing carried entry rollers into surface engagement with each other and through a process zone in precise registry where a transfer of information occurs, by a driven pair of housing carried exit rollers, and then separated to be wound on respective housing supported takeup reels, driven by respective driven rotating sprockets, through clutch pads pressurized for slipping engagement by a takeup balance bar to insure proper tensioning of the strips. The balance bar also mounts indicating means engaged by the clutch pads to indicate the tension in the strips.

An alternative preferred embodiment includes a pair of supply reels from which the continuous strips are pulled, into engagement with each other by driven entry rollers to be pulled through the process zone by exit rollers driven by a faster rotating driven sprocket through slipping clutch pads, which tension the strips in the process zone in response to adjustment of a control spring, and after the exit rollers the strips are separated to be wound on respective driven takeup reels. The alternative preferred embodiment also includes overrunning clutches for the exit rollers for straightening a bight in either strip in the process zone.

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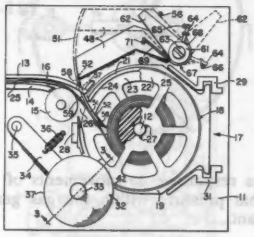
**3,599,897**

## FILM-THREADING SYSTEM

**Elmer O. Wangerin, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.**

**Continuation of application Ser. No. 730,345, May 20, 1968, now abandoned. This application Dec. 22, 1969, Ser. No. 883,662**
**Int. Cl. B11b *15/32*; G03b *1/04***
**U.S. Cl. 242—208** **9 Claims**

An auxiliary film-threading device is incorporated in an automatic film-threading system of the type in which the leading end of a film strip is caused to separate from the film roll wound on a supply reel and to enter a guide channel by rotating the reel in an unwinding direction while successive portions of the reel are flexed toward each other into transverse squeezing engagement with the outer convolution of the film roll. In the event of failure of the automatic system to perform properly, a threading member of the auxiliary film-threading device is movable manually into peripheral contact with the rotating film roll to separate the leading end of the film from the reel and to direct it into the same guide channel.



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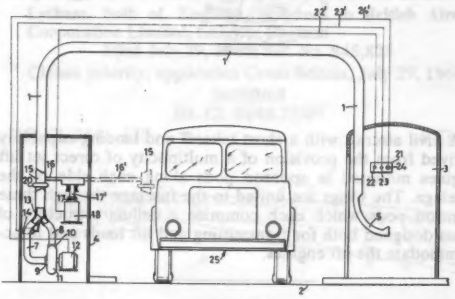
**3,599,898**

## DEVICE FOR DISTRIBUTING TICKETS AND COLLECTING TOLL AT HIGHWAY TOLLGATES AND THE LIKE

**Enrico Bontempelli, Viale Lazio 7, Milan, Italy**

**Filed May 12, 1969, Ser. No. 823,649**
**Claims priority, application Italy, May 28, 1968, 17036 A/68**
**Int. Cl. B65g *51/32, 51/34***
**U.S. Cl. 243—19** **2 Claims**



A device for distributing tickets and collecting tolls at highways and the like includes a pneumatic conveyor duct for transporting a container from the cabin of the ticket-collector to a position within reach of the driver, a portion of said duct being displaceable under the control of means actuated from the collector's cabin.

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**3,599,899**

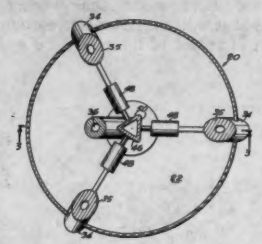
## ROCKET CONTROL

**Edward E. McCullough, Brigham City, Utah, assignor to Thiokol Chemical Corporation, Bristol, Pa.**

**Filed June 20, 1969, Ser. No. 839,783**
**Int. Cl. F42b *15/18***
**U.S. Cl. 244—3.22** **7 Claims**

A special upper stage for a plural-stage rocket includes apparatus for steering the entire rocket or any part thereof, and for igniting an extinguishable rocket motor as needed. It in-

cludes a gas generator from which gases may be proportionately metered to steering nozzles and/or to an ignition



duct by valves responsive to movements of a central cam body, such that pressure within the gas generator always remains constant.

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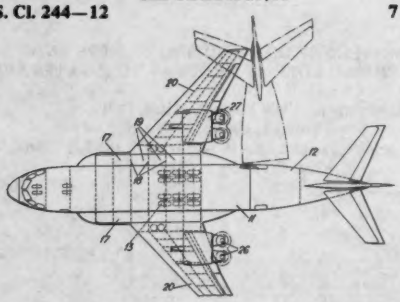
**3,599,900**
**AIRCRAFT**
**Tadeusz Karol Szlenkier, Hatfield, England, assignor to Hawker Siddeley Aviation Limited, Surrey, England**
**Filed Mar. 12, 1969, Ser. No. 806,466**
**Claims priority, application Great Britain, Mar. 15, 1968, 12831/68**
**Int. Cl. B64c *29/00***
**U.S. Cl. 244—12** **7 Claims**



A civil aircraft with a short takeoff and landing capability derived from the provision of a multiplicity of direct jet lift engines mounted in sponson pods along each side of the fuselage. The wings are united to the fuselage through these sponson pods which each comprise a cellular structure of spars designed both for transmitting and lift loads and to accommodate the lift engines.

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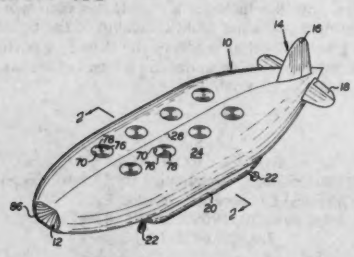
**3,599,901**
**VEHICLE ADAPTED TO LAND AND AIR TRAVEL**
**Allan J. Relkin, 279 4th Ave., East Orange, N.J.**
**Filed Apr. 25, 1969, Ser. No. 819,384**
**Int. Cl. B64c *29/00***
**U.S. Cl. 244—12 B** **21 Claims**



A vehicle adapted for land and air travel comprising, a fuselage having a longitudinal duct therein, means within said longitudinal duct for creating an airstream therethrough, a vertical duct extending about said first duct and fan means mounted within the vertical duct having actuating means located within said longitudinal duct and operable by said air stream therein for causing a flow of air from the upper surface of said fuselage through said vertical duct to be expelled from an exit in the lower surface of the fuselage.

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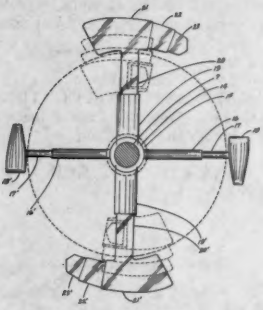
**3,599,902**
**AIRCRAFT**
**John W. Thomley, 3050 N. Brett Ave., Decatur, Ill.**
**Filed Aug. 13, 1969, Ser. No. 849,685**
**Int. Cl. B64c *29/00***
**U.S. Cl. 244—12** **2 Claims**



An aircraft having a fuselage of generally saucerlike character comprising upper and lower disc components separated by a transverse spacing; said upper component being contoured to provide an aerodynamic surface and merging into an upwardly projecting dome which comprises a portion of the pilot compartment. The maximum diameter of said upper component being substantially equivalent to three times the linear distance between the lower face of said spacing and the uppermost point of said dome. Depending from the lower fuselage section is a motor with a swivelly mounted afterburner for controlling the direction of horizontal flight. Provided within said spacing for rotation about an axis normal to the vertical axis of said aircraft are jet motors and airfoils for controlling vertical flight.

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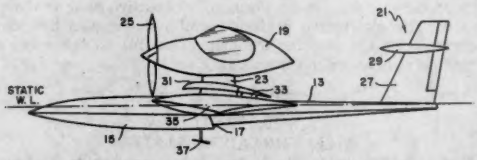
**3,599,903**
**HIGH PERFORMANCE SEAPLANE OR AMPHIBIAN**
**Eugene H. Handler, 4217 Brookfield Drive, Kensington, Md.**
**Filed July 7, 1969, Ser. No. 839,466**
**Int. Cl. B64c *35/00***
**U.S. Cl. 244—13** **4 Claims**



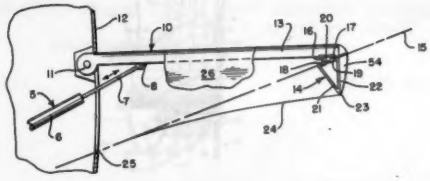

A high performance, low drag, high density seaplane having low reserve buoyancy and a low wing with a central hull supporting passenger cockpit unit thereabove, said hull carrying a hydrofoil beneath for quick takeoff, the central hull also acting as a main fuselage supporting the tail assembly. The power plant may be located in the cockpit unit or in the tail unit.

3,599,904

## SEMIRIGID AIRFOIL FOR AIRBORNE VEHICLES

Philip M. Condit, 7529 S.E. 40th St., Mercer Island, King County, Wash.; Robert A. Ormiston, 151 Calderon Ave., Mountain View, Calif.; Walter Barry Nixon, 30 Merritt Drive, Trenton, N.J., and Thomas E. Sweeney, 61 Overbrook Drive, Princeton, N.J.

Filed June 28, 1968, Ser. No. 740,895
Int. Cl. B64c *1/26, 3/52, 3/56*
U.S. Cl. 244—38 15 Claims



The present invention relates to a semirigid airfoil for use with airborne vehicles and capable of being folded and/or warped. The airfoil includes a rigid spar defining a leading edge and a cable defining the trailing edge with the root end thereof secured to the fuselage of the vehicle and the other end to a tip truss structure, with a flexible material forming top and bottom airfoil surfaces. Means are also provided for twisting portions of the airfoil about an axis extending through the root end, and means for pivoting the spar to fold against the fuselage.

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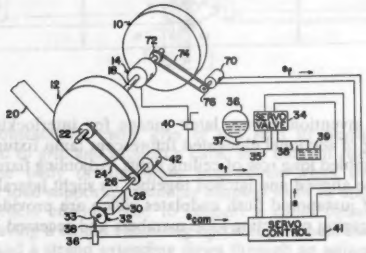
3,599,905

## SERVOCONTROLLED LAUNCHED OR RECOVERY SYSTEM FOR AIRCRAFT

John Sherman Strance, Davenport, Iowa, assignor to Gulf & Western Industrial Products Company, Grand Rapids, Mich.

Continuation-in-part of application Ser. No. 652,518, July 11, 1967, now abandoned. This application June 19, 1969, Ser. No. 840,118
Int. Cl. B64f *1/04*
U.S. Cl. 244—63 6 Claims



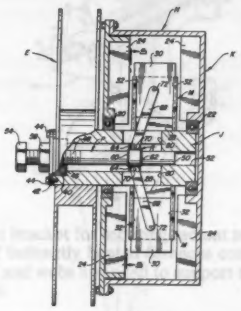

The disclosure relates to a system for servicing aircraft during launch or recovery operations in which a servocontrol is provided to compare the actual rate of launch or recovery with a predetermined optimum rate which is programmed in accordance with the energy requirements of the particular cycle and continuously adjusts the actual rate to minimize any error between the actual and programmed rates.

3,599,906

## ADJUSTABLE ROTARY HYDRAULIC BRAKE

George Horst Reinemuth, Secane, Pa., assignor to Gulf & Western Industrial Products Company, Grand Rapids, Mich.

Filed July 29, 1969, Ser. No. 845,730
Int. Cl. B64f *1/02*
U.S. Cl. 244—110 11 Claims



A rotary hydraulic brake includes a rotor having vanes. The vanes are adjustable radially outward to increase their effective length. An adjustment means is provided to position the rotor vanes at a desirable length and vary the retarding torque produced by the absorber. A programming device may be included for progressively increasing the effective length of the rotor vanes during rotation of the rotor.

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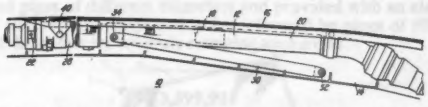
3,599,907

## RETRACTABLE IN-FLIGHT REFUELLING PROBE

Stephen Ransom, Annes-on-Sea, and William N. Bainbridge, Lytham, both of, England, assignors to British Aircraft Corporation Limited, London, England

Filed July 29, 1969, Ser. No. 845,825
Claims priority, application Great Britain, July 29, 1968, 36090/68
Int. Cl. B64d *39/00*
U.S. Cl. 244—135 5 Claims



A fueling probe pivotally mounted on an aircraft has two telescoping fuel pipes. The probe is designed to pivot from a flushed position with the contours of the aircraft adjacent the pilot. One of the fuel pipes forms part of a hydraulic jack for telescoping the probe into position. The probe cover has rollers for permitting the relative movement of the fuel pipes. Means are provided for evacuating any leaking hydraulic oil to the atmosphere so that it does not mix with the fuel.

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3,599,908

## PARACHUTE APPARATUS

James Martin, Southlands Manor, Southlands Road, Denham, near Uxbridge, Middlesex, England

Filed Dec. 17, 1969, Ser. No. 885,712
Claims priority, application Great Britain, Jan. 2, 1969, 281/69
Int. Cl. B64d *17/36*
U.S. Cl. 244—152 5 Claims

Parachute apparatus comprising a main parachute and a drogue parachute connected to the crown of the main

parachute, the main parachute having at least one antisquid line connected between the crown thereof and the shrouds or parts connected thereto, such line having a length sufficient to enable the parachute to squid under a drogue drag load, two spaced-apart portions of the line being interconnected by disconnectable means forming a loop in the line, the overall length of the antisquid line being insufficient to permit the parachute to squid, when the loop is present, the arrangement being such that the parachute may be deployed without squidding when the drogue drag load on the crown thereof is below a predetermined value whereas, when said drogue drag load exceeds said predetermined value, the means interconnecting the spaced-apart line portions is disconnected by said drag load to separate the portions and to increase the overall length of the antisquid line by the length of the loop so as to permit squidding of the parachute.

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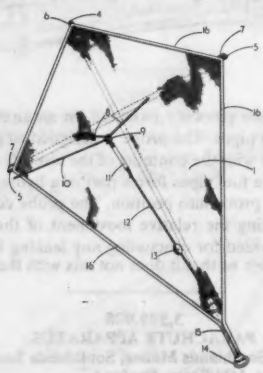
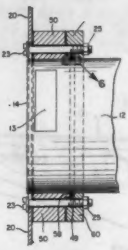
**3,599,909**
**KITES**
Walter Young, 5 Montague Street, Salford 7, Lancashire, England
Filed Dec. 9, 1968, Ser. No. 782,033
Int. Cl. B64c *31/06*
U.S. Cl. 244—153 1 Claim



A kite which is provided with a ring for connection to control line, said ring being attached to the kite by a pair of transverse strings and a third string incorporating a spring attached to the kite toward the tail thereof.

**3,599,910**
**MOUNTING COLLAR FOR PANEL MOUNTED INSTRUMENT**
Frank P. Wipff, Prescott, Ariz., assignor to Narco Scientific Industries, Inc., Ft. Washington, Pa.
Filed Feb. 10, 1969, Ser. No. 797,840
Int. Cl. G12b *9/10*; F16f *15/04*
U.S. Cl. 248—27 4 Claims



A mounting collar is disclosed for use with panel-mounted instruments. The mounting collar is mounted on the instrument behind the instrument panel. By tightening a few screws, the heads of which appear at the front of the panel, the mounting collar is caused to tightly embrace the instrument housing, holding it tightly in place. The instrument may be easily removed without access to the rear of the panel by merely loosening screws at the front of the panel, thereby to release the tight embrace of the mounting collar. The instrument may, of course, also be removed from the back of the panel, in the usual prior art manner.

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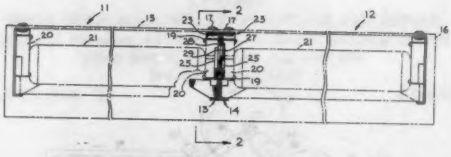
**3,599,911**
**MEANS FOR END-TO-END ASSEMBLY OF ELONGATED FLUORESCENT LAMP CEILING FIXTURES**
Ernest Monte, Los Angeles, Calif., assignor to Sunbeam Lighting Co., Inc., Los Angeles, Calif.
Filed Nov. 6, 1969, Ser. No. 874,482
Int. Cl. F16l *3/00*
U.S. Cl. 248—50 4 Claims



This invention covers latch means for interlocking and aligning of sectional elongated fluorescent lamp fixtures into an assembled long row of ceiling lights. Adjoining fixture sections are aligned and latched together by slight lateral movement of juxtaposed flush endplates which are provided with interengaging projecting loop members and recessed locking tabs.

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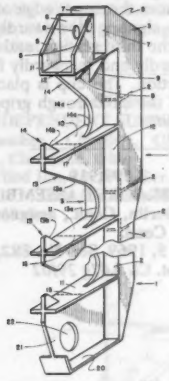
**3,599,912**
**CENTER HUNG RADIANT TUBE SUPPORTS**
Roger C. Stephens, Hamburg, N.Y., assignor to Ferro Frontiers, Inc., Buffalo, N.Y.
Filed May 28, 1970, Ser. No. 41,469
Int. Cl. F16l *3/02*
U.S. Cl. 248—58 3 Claims

A unitary cast bracket for supporting radiant heating tubes

centrally within indirectly heated furnaces comprising a



channel and a plurality of flanges and webs arranged to support the tubes along a tangential seat.

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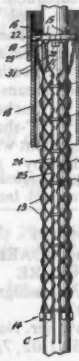
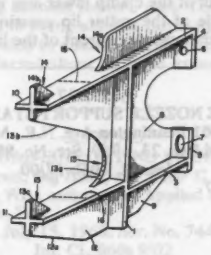
**3,599,913**
**CABLE GRIP**
**Joseph DiPalma, Merritt St., South Norwalk, Conn.**
**Filed Oct. 1, 1969, Ser. No. 862,895**
**Int. Cl. F16l *3/00***
**U.S. Cl. 248—60** **6 Claims**



**A contractable cable grip of the split or nonsplit type adapted to grip and support a cable in a conduit riser has an elongate body of diagonally interwoven wires depending from a load-supporting annulus adapted to fit in and engage the vertical conduit riser to support a cable therein, each wire having a strand extending up through a hole in said annulus and a strand extending down through an adjacent hole when a loop portion engages the upper surface of the annulus, the pair of strands immediately below the annulus being secured tightly together to prevent the strands from pushing back through the holes when pressure is applied to the annulus while the cable grip is forced over the cable into the conduit riser. The annulus of the split grip consists of two semicircular pieces detachably held together by an aligning pin on each piece extending into a hole in the other piece, the annulus having depending lugs to locate it centralized in the conduit.**

**3,599,914**
**RADIANT TUBE SIDEWALL SUPPORTS**
**Roger C. Stephens, Hamburg, N.Y., assignor to Ferro Frontiers, Inc., Buffalo, N.Y.**
**Filed May 28, 1970, Ser. No. 41,443**
**Int. Cl. F16l *3/02***
**U.S. Cl. 248—68** **5 Claims**



**A unitary cast bracket for securing radiant heating tubes to the sidewalls of indirectly heated furnaces comprising a plurality of flanges and webs arranged to support the tubes along a tangential seat.**

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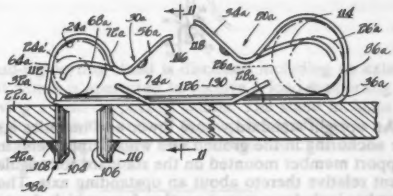
**3,599,915**
**PIPE CLIP**
**Edmund J. Soltysik, Chicago, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.**
**Filed Dec. 10, 1969, Ser. No. 883,981**
**Int. Cl. F16l *3/08***
**U.S. Cl. 248—68** **5 Claims**



**A sheet material clip for securing pipes, tubing and the like to a support and having a portion formed for extending around pipes of different diameters and provided with an element adapted to engage and to be deformed by pipes of different diameters for securely retaining such pipes.**

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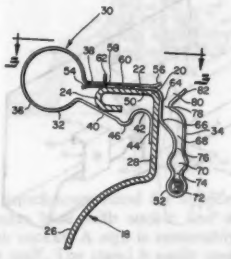
**3,599,916**
**GUTTER CLIP FOR LIGHT STRINGS AND THE LIKE**
**Ferdinand W. Szabo, 17253 McCracken Road, Maple Heights, Ohio**
**Filed July 24, 1969, Ser. No. 844,452**
**Int. Cl. F16l *3/08***
**U.S. Cl. 248—73** **9 Claims**



**A removable clip adapted to be fastened to the front upper edge of a metal gutter, the gutter being of the type having an**

upstanding front side or lip which defines the gutter edge and an inwardly directed flange along the edge. The clip is particularly suitable for supporting light bulb strings or the like, and is in two pieces, both pieces being formed from strips of spring metal. One piece is in the form of a C-shaped clamp having upper and lower arms which embrace the gutter flange from the inside of the gutter, the second piece locking onto the clamp upper arm and having an overhanging portion on the outside of the gutter adapted to engage the light bulb string. The length of the clamp lower arm is such that it bears against the inside of the gutter lip pressing the overhanging portion against the outside or front of the lip.

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**3,599,917**
**HOSE NOZZLE SUPPORT STANDARD**
**Ben Schwartz, 901 Bennington Ave. N.E., Massillon, Ohio**
**Filed Dec. 23, 1969, Ser. No. 887,634**
**Int. Cl. B05b** *17/00*
**U.S. Cl. 248—87** **10 Claims**

An upright standard whose lower end includes a structure for anchoring in the ground and whose upper end includes a support member mounted on the standard for angular adjustment relative thereto about an upstanding axis. The support member includes a mount portion from which the nozzle end of a water hose may be removably supported.

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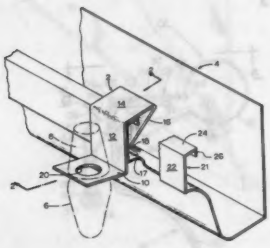
**3,599,918**
**CLIP FOR DECORATIVE LIGHTS AND THE LIKE**
**Charles B. Patchett, 6 Kenewen Court, Toronto 16, Ontario, Canada**
**Filed Dec. 15, 1969, Ser. No. 885,230**
**Int. Cl. A47g** *33/16*
**U.S. Cl. 248—215** **12 Claims**



A thin flexible plastic clip for attaching Christmas lights to eavestroughs, having a first slightly upwardly slanted section with a hole therein. A light bulb is inserted from one side of the hole into a bulb socket on the other side of the hole, and the two are secured together to clamp them to the first section. The clip also includes a second section extending upwardly from the rear edge of the first section; a third section extending rearwardly from the upper edge of the second section; a fourth section slanting downwardly and forwardly from the rear edge of the third section, and a short fifth section extending downwardly and rearwardly from the forward edge of the fourth section. The clip is placed on an eavestrough with the rim of the eavestrough gripped between the second and fourth sections.

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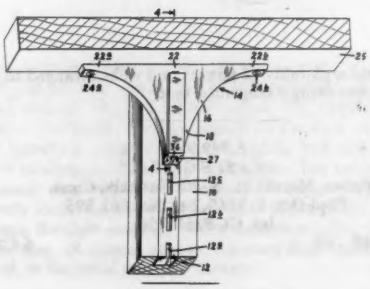
**3,599,919**
**SHELF BRACKET ASSEMBLY**
**Louis G. Bobrowski, Berlin, Conn., assignor to The Stanley Works, New Britain, Conn.**
**Filed Dec. 5, 1969, Ser. No. 882,443**
**Int. Cl. A47g** *29/02*
**U.S. Cl. 248—243** **14 Claims**



A shelf bracket assembly separable into two parts, the shelf-supporting bracket and the hook plate assembly upon which the shelf bracket is mounted. The hook plate assembly is generally "I"-shaped and includes a main body portion having at least one transversely projecting lug and is adapted for engagement with an anchor means, the lug including a locking portion for engaging the anchor means. The shelf-supporting bracket is generally "T"-shaped and is arranged with an integral stem for engagement with the hook plate assembly, being retained thereby against tilting and downwardly directed vertical motion.

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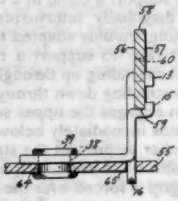
**3,599,920**
**ELECTRIC TERMINAL BOARD MOUNTING STRUCTURE**
**Otto Hoegerl, Saegertown, Pa., assignor to National Tel-Tronics Corp., Yonkers, N.Y.**
**Filed Aug. 18, 1969, Ser. No. 850,825**
**Int. Cl. H05k** *1/02, 7/08*
**U.S. Cl. 248—300** **1 Claim**



A clip-type mounting bracket structure for supporting a planar electric terminal board at an angle with respect to a

supporting chassis. The structure includes a first member having a plurality of bendable tabs adapted to penetrate corresponding openings in the terminal board, and a second member disposed at an angle with respect to the first member engageable with said chassis. In an alternate form of the embodiment, wire-lug-engaging means is formed integrally with the first member.

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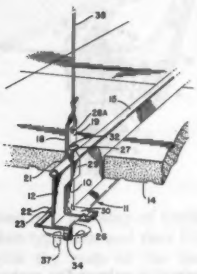
**3,599,921**

**INDEPENDENT SUPPORT CLIPS**

**William J. Cumber, Chardon, Ohio, assignor to Erico Products Inc., Cleveland, Ohio**

**Filed Jan. 14, 1970, Ser. No. 2,725**
**Int. Cl. E04b** *5/52*
**U.S. Cl. 248—317** **3 Claims**



This invention relates to a ceiling hanger or support clip for suspending fixtures and similar devices below a false or subceiling, independently of the latter, which includes a gridlike framework supporting ceiling panel members. The clip includes a pair of complementary cooperating members which when assembled encompasses the beam of the framework, one end thereof being attached to a supporting means extending from the ceiling and the other end receiving the fixture.

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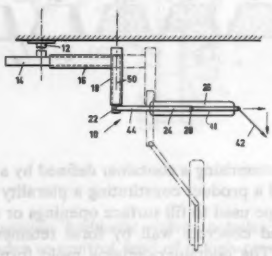
**3,599,922**

**SUSPENSION FOR OPERATING ROOM OVERHEAD LIGHTS**

**Klaus Junginger, Niederrodenbach Uber, Hanau, Germany, assignor to Original Hanau Guarzlampen GmbH, Hanau, Germany**

**Filed July 29, 1969, Ser. No. 845,854**
**Claims priority, application Germany, Aug. 7, 1968, P 17 97 040.0**
**Int. Cl. F21v** *33/00*
**U.S. Cl. 248—333** **8 Claims**



A horizontal, telescoping arm and a vertical, telescoping arm are interconnected, one of the arms being fixed to the ceiling and the other supporting an operating light fixture. A motor is connected to the vertical telescoping arm to move the light in a vertical direction, by moving one of the telescoping arm members with respect to the other, the motor being controlled by a sensing element sensing vertical force components applied to the light fixture. The motor may be electric, or a fluid motor (hydraulic or pneumatic), the motor power being controlled over a servoamplifier (or servo valve) which, in turn, is controlled from a bridge circuit of which the sensing element forms a part. The light fixture, itself, is suspended to swing about a horizontal axis, and limit switches are provided to disable operation of the motor when the fixture is deflected about an angle exceeding a predetermined limit.

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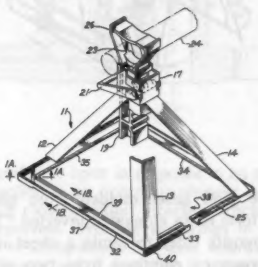
**3,599,923**

**LOAD-SUPPORTING STAND**

**Wayne E. Hunnicutt, Big Bend, and Peter G. Rossbach, Wau-Kesha, both of, Wis., assignors to Applied Power Industries, Inc., Milwaukee, Wis.**

**Filed July 15, 1968, Ser. No. 744,747**
**Int. Cl. B60s** *9/02*
**U.S. Cl. 248—352** **4 Claims**



A load-supporting stand is disclosed including an extensible post which is apertured to receive a load-supporting rod and having a load-supporting saddle. The stand includes depending legs with the ends of the legs being affixed to a base having upstanding flanges which retain the ends of the legs from lateral movement.

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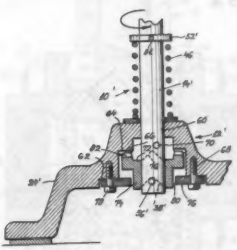
**3,599,924**

**STAND FOR SUPPORTING A STREET SIGN**

**Carl H. Schmidgall, Foot of Leland St., Peoria, Ill.**

**Filed Aug. 1, 1969, Ser. No. 846,784**
**Int. Cl. F16m** *11/08*
**U.S. Cl. 248—403** **3 Claims**



A portable knockdown stand for supporting a street sign having a circular base with socket and a staff removably mounted in the socket. A sign is removably mounted on the top end of the staff. The stand is easily assembled and disassembled and is provided with a substantial joint massive gear ring between the staff and base. The staff is slidably mounted and is spring loaded. Spaced pins on the staff alternately engage the gear ring. In elevated position of the staff with

spring expanded, the staff is nonrotatable with respect to the base. In lowered position, the staff can be rotated with respect to the base.

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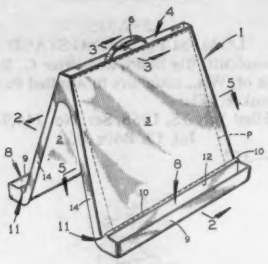
**3,599,925**

## PORTABLE DUAL EASEL

**Dorothea L. Dubler, Coral Gables, Fla., assignor to Josephine A. L. Sonde, Coral Gables, Fla., a part interest**

Filed May 25, 1970, Ser. No. 22,533
Int. Cl. A47b *97/04*; B43l *5/02*
U.S. Cl. 248—452 4 Claims



A one-piece dual easel molded from plastic material shaped in the form of an elongated inverted "V" and having a panel on opposite sides to retain a sheet of material for receiving drawings or paintings from two oppositely positioned users. An integral compartment extending from the base of each panel is provided for holding a plurality of paint containers and a handle means provided at the top junction of the panels for transport purposes. Each of the easels is tapered for nesting a plurality one above the other in a vertical stack.

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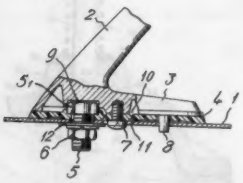
**3,599,926**

## REARVIEW-MIRROR ATTACHING APPARATUS FOR VEHICLE

**Yukio Takahashi, Yokohama-shi, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan**

Filed Sept. 24, 1969, Ser. No. 860,767
Claims priority, application Japan, Sept. 24, 1968, 43/82887
Int. Cl. B60r *1/06*; E04b *1/00*
U.S. Cl. 248—475 A 3 Claims



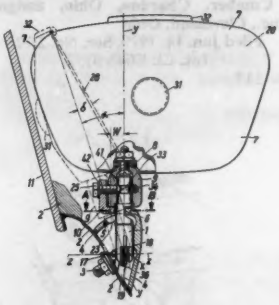
A breakoff rearview mirror attachment including an attaching base connected by a bolt to a breakable or frangible plate which is in turn connected to a vehicle body by a further and separate connecting member. The attaching base has a pin extending through the plate and body. The plate is provided with a groove encircling the connecting member.

**3,599,927**

## REARVIEW MIRROR

**Yorck Joachim Talbot, 7 Ballenstedterstrasse, 1000 Berlin, Germany**

Filed Feb. 20, 1969, Ser. No. 801,031
Claims priority, application Germany, July 5, 1968, P 17 55 899.5
Int. Cl. B60m *1/06*
U.S. Cl. 248—484 14 Claims



An external rearview mirror for motor vehicles includes a base mountable on the coachwork of the vehicle. An arm is mounted on the base projecting therefrom and is tiltable about an axis which at least substantially parallels the longitudinal axis of the vehicle so as to be movable from an operating position in which it projects laterally beyond the coachwork to a retracted position. A mirror-head is associated with the arm and means is provided which mounts the mirror-head on the arm for turning movement about an upright axis normal to the longitudinal axis of the vehicle, and this means is operative for effecting tilting of the arm about the axis paralleling the longitudinal axis of the vehicle in direction towards the coachwork in response to turning movement of the mirror-head initiated by an impact on the same acting in direction of the longitudinal vehicle axis.

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**3,599,928**

## DISCARDABLE MOLD FORM

**Gardner H. Strong, 22 Olive Ave., Piedmont, Calif.**

Filed Nov. 6, 1968, Ser. No. 773,890
Int. Cl. B28b *7/24*; B65d *85/00*
U.S. Cl. 249—119 7 Claims

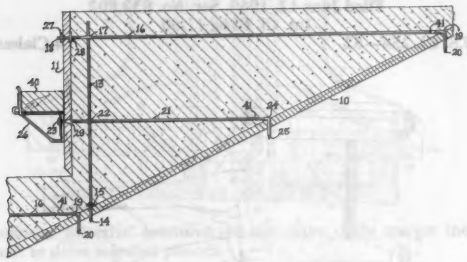
A package comprising a container defined by a discardable mold form and a product constituting a plurality of concrete plugs of the type used to fill surface openings or recesses left along a poured concrete wall by form retainers that pass therethrough. The container-defining mold form has a plurality of mold pockets therealong in each of which a concrete plug is confined; and the plugs are molded, stored and shipped in the form which is constituted of a peelable or tearable material enabling each pocket to be opened to release the concrete plug therewithin as such plug is needed for use.

3,599,929

## BRACKET FOR ASSEMBLING CONCRETE FORMS

William G. Holley, Sr., and John E. Lester, both of P.O. Box F, Williamsburg, Va.

Filed Dec. 8, 1969, Ser. No. 883,217
Int. Cl. B28b 7/22
U.S. Cl. 249—213 6 Claims



A bracket comprised of a plurality of rodlike members for assembling sloping slab-type stair and riser forms that receive poured concrete, with the rods of the bracket providing protruding extremities to which may be removably mounted the soffit portion of the form and riser waler supports that strengthen and align the assembled form structure during the pouring and curing of the concrete.

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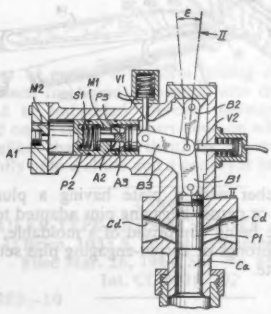
3,599,930

## RAPID OPENING HIGH PRESSURE HYDRAULIC VALVE

Michel Philippe Lucien Bourgeot, and Guy Ferrand, both of Bourges, France, assignors to Etat Francais Delegation Ministerielle four l'Armement, Paris, France

Filed Mar. 4, 1970, Ser. No. 16,299
Claims priority, application France, Mar. 4, 1969, 6905755
Int. Cl. F16k 31/44
U.S. Cl. 251—73 10 Claims



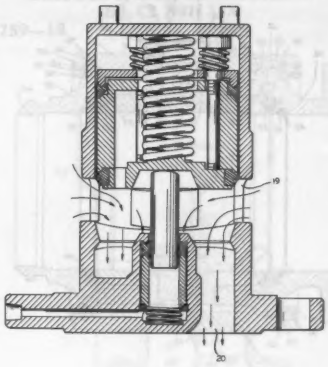
A high-pressure hydraulic valve includes a piston in a supply cylinder to control feed of a high-pressure liquid via outlets in the cylinder. The piston is connected via a toggle linkage to a resistance arrangement including a further piston acting on an air cushion in a respective cylinder. The toggle linkage substantially diminishes the stress from the supply piston to the resistance arrangement and makes possible rapid opening of the outlets in extremely short time for high flows at high pressure.

3,599,931

## INTERNAL SAFETY SHUTOFF AND OPERATING VALVE

Herbert G. Hanson, Arlington Heights, Ill., assignor to G P E Controls, Inc., Morton Grove, Ill.

Filed Sept. 11, 1969, Ser. No. 857,006
Int. Cl. F16k 31/143; F16j 15/00
U.S. Cl. 251—144 7 Claims



A valve operable to open in response to an operating pressure being supplied to an operating plunger assembly and to close the check close in either direction when the operating pressure is removed. Dynamic seal rings in the valve are spring loaded to compensate for wear and/or thermal contracting conditions, and a seat ring is mounted to likewise compensate for wear and/or thermal contracting conditions.

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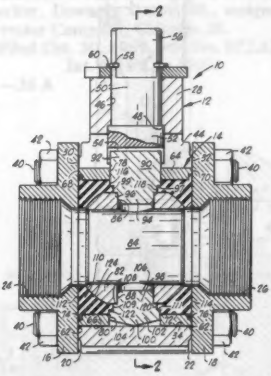
3,599,932

## BETWEEN FLANGE JOURNALED BALL VALVE ASSEMBLY

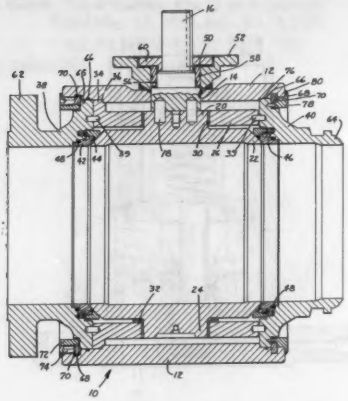
Domer Scaramucci, 3245 S. Hatlie, Oklahoma City, Okla.

Continuation-in-part of application Ser. No. 763,644, Sept. 30, 1968. This application Apr. 18, 1969, Ser. No. 817,435
Int. Cl. F16k 5/06
U.S. Cl. 251—151 23 Claims



A valve assembly, particularly useful between flanges, which utilizes a housing unit and a separate valve unit. The housing unit provides a supporting housing adapted to be supported between the flanges, and includes a valve operator and a first valve stem. The valve unit is sized to be removable lengthwise from the housing unit, and includes a valve member which is journaled in the valve body.

3,599,933
ROTARY VALVE BEARING ASSEMBLY
Jack E. Piccardo, Oakland, Calif., assignor to Grove Valve and Regulator Company, Oakland, Calif.
Filed Feb. 5, 1970, Ser. No. 8,840
Int. Cl. F16k 5/06
U.S. Cl. 251—309 10 Claims



A valve structure comprising a rotatable valve member with a pair of coaxial trunnions extending therefrom. Bearing blocks are received on the trunnions and the entire assembly may be inserted into a tubular valve body. A radial flange extends from one end of each bearing block to be clamped firmly between an internal shoulder in the body tube and the adjacent valve end closure.

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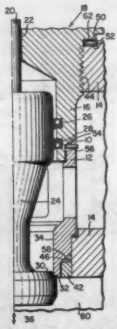
3,599,934
MULTIPURPOSE FORCE RING
Wayne D. Reed, Philadelphia, Pa., assignor to Honeywell, Inc., Minneapolis, Minn.
Filed Jan. 28, 1970, Ser. No. 6,598
Int. Cl. F16k 25/00
U.S. Cl. 251—363 10 Claims



A truncated cone-shaped ring member for inserting between two encased relatively movable parts, such as a bonnet and a cage located within a valve body, so that the adjustment of these parts towards one another will cause the ring to be moved toward an inverted truncated cone-shaped configuration and thereby provide a means that will take up not only the differences in manufacturing tolerances of these parts and their undesired changes in size that occur due to ambient temperature of the atmosphere surrounding these parts but also provide a means to maintain a seal that is in contact with at least one of these parts in fixed fluid tight engagement with the encasement surrounding these parts before, during and after the occurrence of the aforementioned ambient temperature changes.

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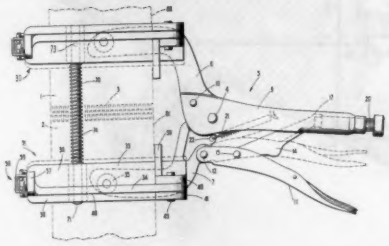
3,599,935
BELT PULLER
Dana Walker, Delray Beach, Fla., assignor to Kay Sjostrom, Boca Raton, Fla.
Filed June 12, 1969, Ser. No. 832,802
Int. Cl. F16g 11/00
U.S. Cl. 254—52 4 Claims



A belt puller for clamping together for interengagement adjacent free ends of elongated objects, such as industrial belting. A pair of clamps supported on movable arms engage these free ends and draw them together upon the squeezing of an interconnected hand clamp.

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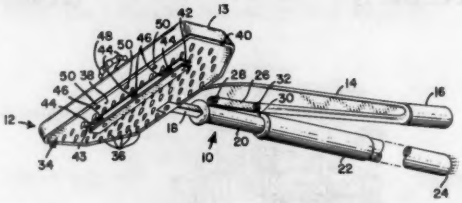
3,599,936
CARPET STRETCHER PLATE
Millard Crain, Jr., San Jose, Calif., assignor to Crain Cutter Company, Inc., Santa Clara, Calif.
Filed Sept. 5, 1969, Ser. No. 855,673
Int. Cl. A47g 27/04
U.S. Cl. 254—62 6 Claims



A carpet stretcher with a plate having a plurality of protruding prongs or carpet-engaging pins adapted to engage a carpet, the plate being comprised of a moldable, resilient material with the prongs or carpet-engaging pins set in position within the plate.

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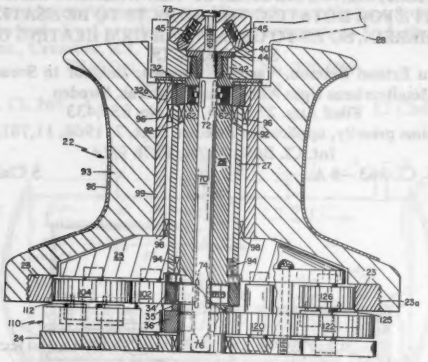
3,599,937
WINCH
John Henry Carter, Weston, Mass., assignor to Aeromarine Corporation, Weston, Mass.
Filed Feb. 17, 1969, Ser. No. 799,802
Int. Cl. B66d 1/30
U.S. Cl. 254—150 6 Claims

A multiple-speed winch having a plurality of independently rotatable pinions coaxial with a drive shaft, drive linkages of varying mechanical advantage connecting these pinions to the winch drum and a shaft engager for engaging a selected pinion to the drive shaft. The shaft engager includes drive cams associated with the pinions and mounted for movement

between an extended position which prevents relative rotation of pinion and shaft a retracted position which permits



rotation; selective extension of the drive cams causes the shaft to drive selected pinions.

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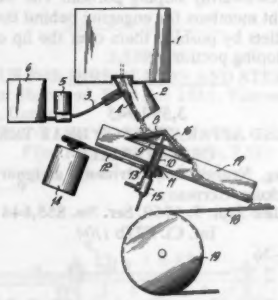
**3,599,938**

**METHOD OF AND APPARATUS FOR MIXING LIQUID TO A VISCOUS MASS**

**Gerhard Anders, Viersen, and Werner Jung, Monchengladbach, both of, Germany, assignors to Hamac-Hansella GmbH, Viersen, Germany**

**Filed Mar. 17, 1970, Ser. No. 20,178**
**Claims priority, application Germany, Mar. 27, 1969, P 19 15 712.1**
**Int. Cl. B01f** *7/02, 15/02*
**U.S. Cl. 259—7** **7 Claims**



In order to ensure a uniform mixing of a liquid with a viscous mass, the liquid is injected into the flowing viscous mass and is embedded therein; thereupon said mass is deposited on an inclined rotary cone on which it is wound in a spindlelike shape and then, by its own weight, flows downwardly onto a chute and a conveyor belt.

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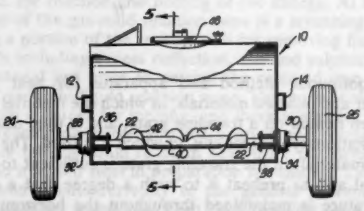
**3,599,939**

**TRAILER-TYPE LIQUID CARRIER AND MIXER**

**Louis M. O'Brien, 1033 S. 2nd St., Alhambra, Calif.**

**Filed Mar. 26, 1969, Ser. No. 810,627**
**Int. Cl. B01f** *7/02*
**U.S. Cl. 259—10** **10 Claims**



A trailer-type liquid carrier supported by wheels including an airtight tank for receiving liquid within which an axle encompassed by spiral vanes is contained and connected with one of the wheels so that as the wheel rotates the axle and spiral vanes correspondingly rotate.

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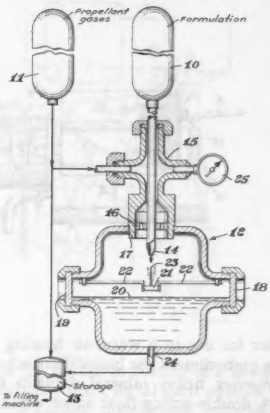
**3,599,940**

**METHOD FOR SATURATED LIQUID AEROSOL FORMULATIONS**

**Lawrence Peoples, Bay City, Mich., assignor to The Dow Chemical Company, Midland, Mich.**

**Filed Dec. 1, 1969, Ser. No. 881,087**
**Int. Cl. B01f** *5/00*
**U.S. Cl. 259—18** **3 Claims**




A method for saturating liquid formulations prior to loading into aerosol containers comprising introducing the liquid formulation into a pressurized chamber in such a manner to impinge onto the edge of a rapidly vibrating blade, withdrawing the gas-saturated liquid from the pressurized chamber into a storage chamber maintained under a similar pressure thereby to maintain the gas-saturated liquid intact, said pressurization of the chamber being maintained by introduction of the saturating gas.

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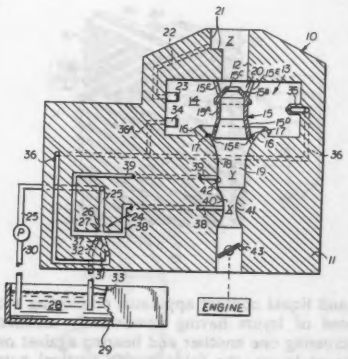
**3,599,941**

**FLUIDIC-FUEL-METERING SYSTEM**

**Bruce H. Becker, Downers Grove, Ill., assignor to International Harvester Company, Chicago, Ill.**

**Filed Oct. 30, 1969, Ser. No. 872,623**
**Int. Cl. F02m** *69/04*
**U.S. Cl. 261—36 A** **9 Claims**




A novel carburetor arrangement for metering fuel to form a fuel-air mixture for delivery to a spark ignition engine

which provides a single fuel-metering system for all engine operating conditions including idling as well as full load conditions. The preferred system features a unique combination of a fluid amplifier with a vortex amplifier for metering liquid fuel and discharging same into the airflow thereby converting an airstream into a uniform fuel-air mixture of substantially constant ratio of fuel-to-air for delivery to the engine.

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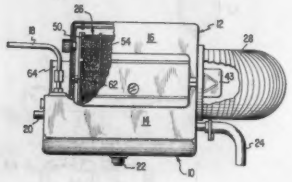
**3,599,942**

**HUMIDIFIER**

Paul A. Herr, 1518 Country Club Drive, Lancaster, Pa.

Filed Sept. 27, 1968, Ser. No. 763,299
Int. Cl. F24f *3/14*
U.S. Cl. 261—92 7 Claims



A humidifier for use in a warm-air heating system is disclosed. In one embodiment the humidifier includes a bleedoff drain for removing heavy mineral deposits resulting from hard water. A double-acting float valve which is responsive to the action of an airflow vane controls inlet water. The case of the humidifier has interchangeable panels so that the inlet duct can be installed on either side without necessitating any modifications. The rotating evaporator drum has removable end caps for ease in cleaning or replacing the evaporator pad enclosed therewithin.

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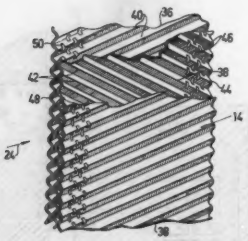
**3,599,943**

**LIQUID AND GAS CONTACT APPARATUS**

Carl Georg Munters, 1 Bengt farjares vag, Stocksund, Sweden

Filed Mar. 20, 1969, Ser. No. 808,882
Claims priority, application Sweden, Apr. 4, 1968, 4,506/68
Int. Cl. B01f *3/04*
U.S. Cl. 261—95 6 Claims



Gas and liquid contact apparatus employing a contact fill composed of layers having downwardly inclined folds or pleats crossing one another and bearing against one another in adjacent layers, the folds having vertical cuts near the lowermost edge thereof or being cut off short of the adjacent layer edge so that liquid flowing along the folds changes its direction of flow prior to the liquid reaching the edge.

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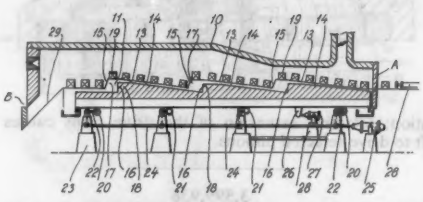
**3,599,944**

**ARRANGEMENT IN HEATING FURNACES OR HEAT TREATMENT FURNACES OF THE WALKING BEAM TYPE FOR ROTATING THE OBJECTS TO BE HEATED THEREIN, SO AS TO OBTAIN UNIFORM HEATING OF SAID OBJECTS**

John Erland Erixson, Vasteras, Sweden, assignor to Svenska Metallverkens Ugns Aktiebolag, Vasteras, Sweden

Filed Aug. 27, 1969, Ser. No. 853,433
Claims priority, application Sweden, Sept. 2, 1968, 11,781/68
Int. Cl. B65g *25/04;* F27b *9/14*
U.S. Cl. 263—6 A 5 Claims



An arrangement in heating furnaces or heat treatment furnaces of the walking beam type for rotating the objects to be heated therein so as to obtain uniform heating of said objects. The hearth of the furnace includes at least one movable walking beam, the stationary portion of the hearth presents one or more support surfaces which are terminated by a relatively steep, downwardly sloping portion. The walking beam presents upright members for engaging behind the billets and rolling said billets by pushing them over the lip of the steep, downwardly sloping portion.

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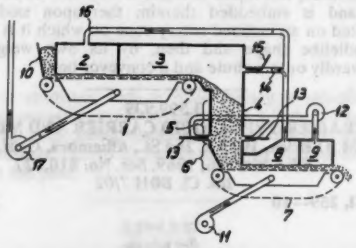
**3,599,945**

**METHOD AND APPARATUS FOR HEAT TREATMENT OF MATERIALS**

Bernd Helming, Neubeckum, Germany, assignor to Polysius AG, Neubeckum, Germany

Filed Sept. 5, 1969, Ser. No. 855,644
Int. Cl. F27b *1/04*
U.S. Cl. 263—36 8 Claims



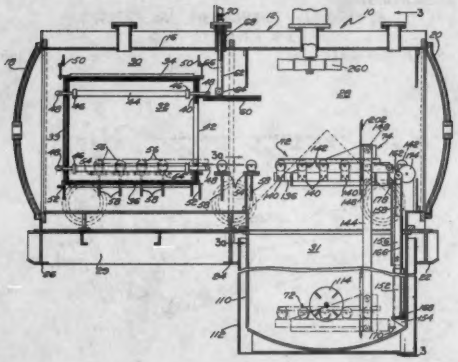
A continuous method and apparatus for heat treating granular and pelleted materials, in which the material is dried and then heated on a traveling grate, and is then discharged into a stationary vertical kiln, in which it is fired. The heating of the material on the traveling grate is sufficient to dry the material and to preheat it to such a degree that a uniform temperature is maintained throughout the horizontal cross section of the kiln.

3,599,946

## VACUUM FURNACE WITH ELEVATOR OIL QUENCH

Herbert W. Westeren, Barrington; William H. Kimball, Providence; Vincent Scotto, Warwick, and Wallace S. Vanderford, Jr., Coventry, all of, R.I., assignors to C. I. Hayes Inc., Cranston, R.I.

Filed Oct. 25, 1968, Ser. No. 770,779
Int. Cl. C21d 1/66
U.S. Cl. 266—4 A 13 Claims



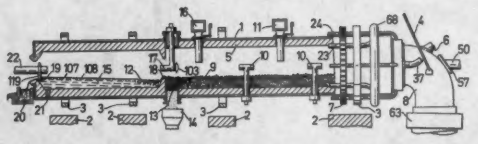
A high-vacuum electric furnace for heat treating metallic articles in an evacuated heating chamber and including an elevator to which the articles are transferred after the heat-treating cycle for transferring the articles to a quench zone for the quick quenching thereof, the quenching zone communicating with the housing in which the heating zone is located and being maintained under vacuum during the quenching operation.

3,599,947

## APPARATUS FOR DIRECT IRON AND STEEL MAKING

William Lyon Sherwood, P.O. Box 2161, Vancouver 3, British Columbia, Canada

Division of Ser. No. 398,625, Pat. No. 3,503,736.
Filed Feb. 2, 1970, Ser. No. 7,553
Int. Cl. C21b 11/06
U.S. Cl. 266—9 13 Claims



The apparatus comprises a single, elongated rotary furnace reactor, including a gas-solid reaction zone, a gas-solid-liquid reaction zone and a gas-liquid reaction zone extending in this sequence from the charge end to the discharge end. A feeding device is provided at the charge end of the reactor for introducing a charge of iron ore pellets in admixture with solid reductant and sulphur-absorbent material into the gas-solid reaction zone. There are burners at intervals along the furnace for introducing oxygen-containing gas and fuel, as required, for reaction and heating of the charge. At the termination of the gas-solid reaction zone is a screening device forming a portion of the reactor wall for removing fine-sized materials including excess reductant, ash and sulphur-absorbent material just prior to passing the retained iron pellets into the gas-solid-liquid reaction zone. This zone is also provided with a burner for melting, and there is another burner at the reactor discharge end for heating and temperature control in the gas-liquid reaction zone prior to discharge of the liquid iron and steel in preparation for casting. The reactor is fired countercurrently to the general movement of charge, whereby waste heat from each reaction zone is utilized as supplementary heat for preceding zones.

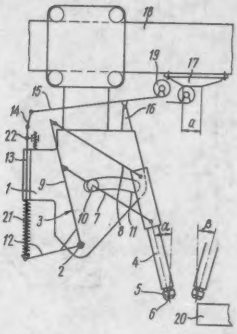
The invention is a process and apparatus for the production of liquid iron and steel directly from iron ore or ore concentrates.

3,599,948

## APPARATUS FOR FLAME-CUTTING OF METAL

Leonid Alexandrovich Bykov, ul. Mashinostroitelei, 59, kv.30; Evgeny Jukhimovich Gelfenbein, ul. 40 Let Oktyabrya, 28, kv.51, and Anatoly Ivanovich Litvinov, ul. Kirovogradskaya, 11, kv.18, all of Sverdlovsk, U.S.S.R.

Filed July 15, 1968, Ser. No. 744,814
Int. Cl. B23k 7/10
U.S. Cl. 266—23 D 1 Claim



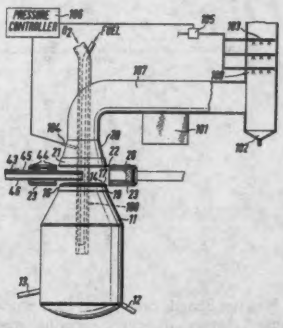
An apparatus for the flame cutting of a metal component and more particularly thick metal such as slabs produced on continuous metal-casting installations including a carriage movable along a main frame across the metal component being cut, a cutting torch provided with a nozzle having an end and an articulated multilink appliance for suspending the torch on the carriage. The multilink appliance is defined by a parallelogram so designed that the cutting torch turns about the center of its nozzle end whereby the nozzle end turns and moves along a straight line parallel to the surface of the metal component being cut and the distance between the nozzle end and the surface of the metal component remains constant over the entire width of the metal component.

3,599,949

## MANUFACTURE OF STEEL

Hugh Willmott Grenfell, Glamorgan, Wales, assignor to The Steel Company of Wales Limited, Glamorgan, Wales

Filed Feb. 23, 1968, Ser. No. 707,623
Claims priority, application Great Britain, Feb. 23, 1967, 8737/67
Int. Cl. C21c 5/42
U.S. Cl. 266—35 10 Claims




A method for refining a molten metal particularly steel which includes the steps of placing a hood in the closed posi-

tion over and in contact with a refining vessel, introducing a stream of oxygen/carbonaceous fuel such as fuel oil into the space below the hood and above the molten metal, igniting the oxygen/carbonaceous fuel stream with the hood located in said closed position over the refining vessel and the drawing off of resulting gases through the hood to a gas washer.

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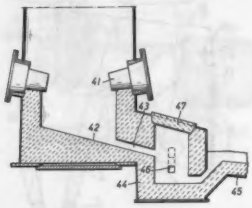
**3,599,950**

**HOT-BLAST CUPOLA FURNACE**

**Siegfried Tunder, Dusseldorf, Germany, assignor to Gesellschaft fur Huttenwerksanlagen m.b.H., Dusseldorf, Germany**

**Filed July 19, 1968, Ser. No. 746,047**
**Claims priority, application Germany, Dec. 6, 1967, P 15 83 452.3**
**Int. Cl. C21b 7/00**
**U.S. Cl. 266—25** **9 Claims**




A hot-blast cupola furnace with a liningless stack having a water-cooled jacket and a hearth with a refractory lining below the level of the tuyeres of the furnace is provided with an inclined hearth bottom which is connected through separate channels to at least two pressure siphons at a lower level than the hearth bottom and the tuyeres are provided with cooling means which are arranged to cool the upper parts of the tuyeres more vigorously than the lower parts. This furnace is operated with an acid slag and at such a rate that from 8 to 15 metric tons of melt is produced per hour per square meter of hearth area. Both the iron and the slag produced are continuously tapped from the hearth and are run into one of the pressure siphons where they are allowed to react together.

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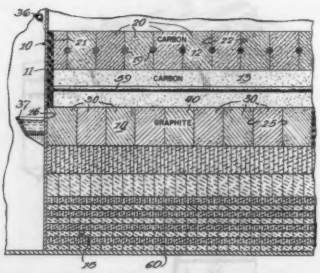
**3,599,951**

**BLAST FURNACE HEARTH**

**Lawrence G. Maloney, Munster, Ind., assignor to Inland Steel Company, Chicago, Ill.**

**Filed Nov. 27, 1968, Ser. No. 779,492**
**Int. Cl. C21b 7/10**
**U.S. Cl. 266—32** **9 Claims**




A blast furnace hearth composed of a plurality of horizontally disposed layers of carbonaceous material enclosed within a metallic peripheral cooling member. Lowermost layer is preferably graphite and outermost extremities thereof are in heat-conducting abutment with inner surface of cooling member. Construction joints, if any, are composed of carbon paste and are diametrical, not peripheral, and can contain thermocouples.

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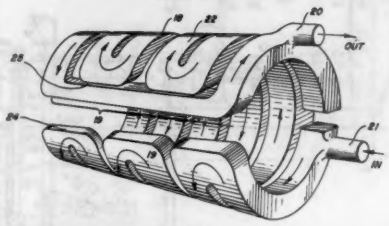
**3,599,952**

**HIGH-VELOCITY TUYERE WITH VARIABLE SIZE COOLING MEDIUM PASSAGE**

**William E. Slagley, Crown Point, and Lawrence G. Maloney, Munster, both of, Ind., assignors to Inland Steel Company, Chicago, Ill.**

**Filed May 7, 1969, Ser. No. 822,372**
**Int. Cl. C21b 7/16**
**U.S. Cl. 266—41** **7 Claims**




A blast furnace tuyere having a graduated convolute-shaped cooling passage for a cooling medium. The cooling medium travels at a high velocity in a substantially helical movement as it moves along the tuyere.

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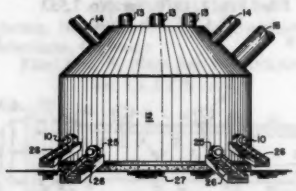
**3,599,953**

**METHOD AND APPARATUS FOR PLUGGING FURNACE TAPS**

**Elwin L. Smith, 720 Balsam, Pocatello, Idaho**

**Filed May 21, 1969, Ser. No. 826,477**
**Int. Cl. C21b 7/12**
**U.S. Cl. 266—42** **7 Claims**




A method of using wooden plugs to plug tapholes through which slag and metal are periodically removed from phosphorous furnaces and the like. In accordance with the method, green, wooden plugs are inserted into drilled tapholes and the hot material discharging from the furnace burns all or part of the plugs to form a charcoal plug. The hot material most remote from the center of the furnace cools and solidifies to form even more permanent plugs as it moves into the tapholes and as the wooden plugs are burned and charred.

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**3,599,954**

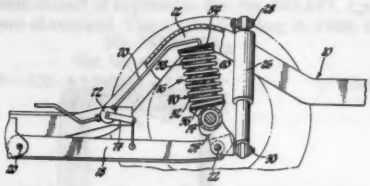
**COMPOUND VACUUM SPRING**

**Ming-chih Yew, Sterling Heights, Mich., assignor to General Motors Corporation, Detroit, Mich.**

**Filed Oct. 8, 1969, Ser. No. 864,599**
**Int. Cl. B60g 11/58**
**U.S. Cl. 267—34** **7 Claims**

A vehicle suspension system in which a pair of vacuum energized auxiliary spring bellows are nested within the confines of the primary coil suspension spring between the

sprung and unsprung masses of the vehicle, each such spring bellows providing a load simulating force on the coil spring



acting additively with the other spring bellows to alter the static height of the sprung mass.

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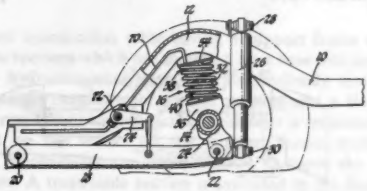
3,599,955
NESTED COMPOSITE SPRING ASSEMBLY WITH MULTIPLE AUXILIARY SPRING UNITS
Ming-chih Yew, Sterling Heights, Mich., assignor to General Motors Corporation, Detroit, Mich.
Filed Oct. 8, 1969, Ser. No. 864,600
Int. Cl. B60g 11/58
U.S. Cl. 267—34 4 Claims



A vehicle suspension system in which a plurality of vacuum energized auxiliary spring bellows are nested within the confines of the primary coil suspension spring between the sprung and unsprung masses of the vehicle, each of the auxiliary spring bellows being connected in direct force transferring relation between the sprung and unsprung masses to provide a load-simulating force on the coil spring acting in parallel with the other auxiliary spring bellows to alter the static height of the sprung mass.

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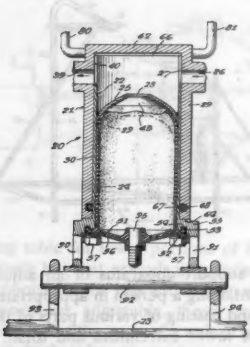
3,599,956
FLUID CUSHIONING ASSEMBLY
Arthur J. Harder, Jr., Franklin Park, Ill., assignor to Coach and Car Equipment Corporation, Elk Grove Village, Ill.
Filed Aug. 22, 1969, Ser. No. 852,433
Int. Cl. F16g 5/00
U.S. Cl. 267—120 22 Claims



A fluid cushioning assembly for absorbing the shock of, for example, a seat on a vehicle traveling rough terrain. The assembly includes a cylinder connected to the seat and slidably mounted on the outside of an inner housing connected to a base. The cylinder contains hydraulic fluid and moves in and out (up and down) on the housing in response to the respective application and removal of an external load. Valve means restricts the velocity of outward movement of the cylinder to substantially less than the velocity of the immediately preceding inward movement.

The housing contains a flexible bladder within which is confined a compressible fluid. The bladder is readily removable from the assembly without substantial removal of the housing.

A second hydraulic cylinder is slidably mounted outside the first cylinder and can be raised or lowered to adjust the elevation of the seat.

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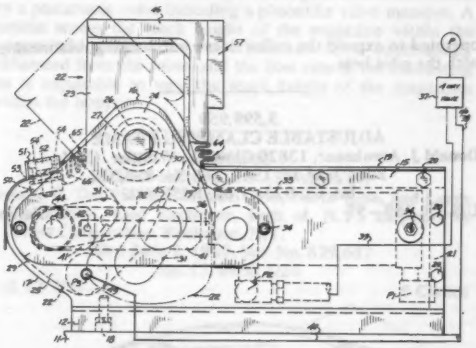
3,599,957
CAM WEDGE POWER SWING AWAY WITH GUIDED ARM
Leland F. Blatt, 24121 Mound Road, Grosse Pointe, Mich.
Filed Apr. 28, 1969, Ser. No. 819,546
Int. Cl. B23q 3/08
U.S. Cl. 269—32 7 Claims



In a power clamp having within its housing a cylinder and piston rod and a swing arm pivoted on the housing and cam rollers connected to the rod and movable in angular slots in said arm to pivot the arm from "swing away release" to "work-locating position," the improvement which consists of stop means on the housing to adjustably limit the movement of the arm to locating position, together with lateral thrust means on the arm pivot between the housing and arm on its opposite sides and additional power operated lateral thrust means on the housing remote from the arm pivot operatively and slidably engageable with said arm upon its opposite sides as it pivots to workpiece-locating position said arm including a swing away clamping means for retainingly engaging one or more workpieces.

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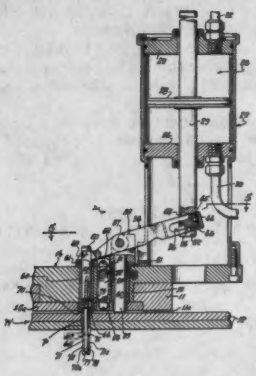
3,599,958
ACTUATOR FOR EXPANSIVE COLLET SLEEVE DEVICE ADAPTED FOR SECURING MACHINE TOOL TO WORKPIECE OR ANCHORAGE MEMBER
Rudolf R. Schindler, Los Angeles, Calif., assignor to Omark-Winslow Aerospace Tool Co., Portland, Oreg.
Filed Dec. 11, 1968, Ser. No. 782,985
Int. Cl. B23b 45/14; B23q 3/14
U.S. Cl. 269—48.1 8 Claims

A device for securing a machine tool, such as a power drill, to a workpiece or a jig, using a plot hole in the workpiece or jig, and a radially expansive collet sleeve which is thrust from the machine tool into the pilot hole, and then expanded therein by a mandrel running through the collet sleeve and acting through a cam to expand the collet. The expansive collet sleeve is mounted in and projects from a holder sleeve which is reciprocable through a guide bore in a workpiece-engaging member on the drill. The holder sleeve is advanced

through this guide bore to project the collet sleeve through the pilot hole in the workpiece, and the mandrel is then



operated to expand the collet sleeve into locking relationship with the pilot hole.

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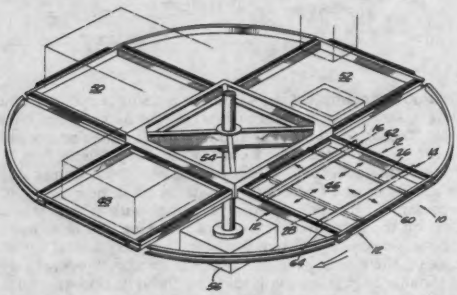
**3,599,959**
**ADJUSTABLE CLAMPING FRAME**
**Donald J. Asenbauer, 13820 Close St., Whittier, Calif.**
**Filed June 16, 1969, Ser. No. 833,332**
**Int. Cl. B23q 7/02; B25b 5/02**
**U.S. Cl. 269—57** **7 Claims**



The illustrated adjustable clamping frame is mounted at one station of a rotary platform thermoforming press. The clamping frame is rectangular and its dimensions are altered by choosing one parallel set of frame sides and giving them uniform properties throughout their entire length up to the maximum capacity of the frame, adjustment being accomplished by changing the length of and spacing between the second set of parallel sides, with the length being precisely determined by a removable gripping bar. A mating jaw for the gripping bar is supported on a carriage from which it is readily removable.

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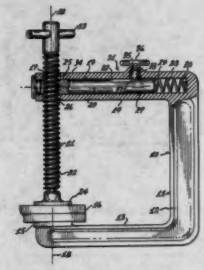
**3,599,960**
**SCREW CLAMP**
**John R. Phillips, 12219 S. 71st St., Tempe, Ariz.**
**Filed June 12, 1969, Ser. No. 832,574**
**Int. Cl. B25b 1/12, 5/10**
**U.S. Cl. 269—182** **2 Claims**

A screw clamp having a threadably mounted clamping spindle provided with a quick-release segmental nut device



for rapid coarse adjustment with respect to a workpiece.

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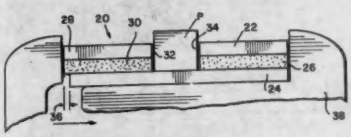
**3,599,961**
**MEANS PROVIDING A HOLDING DEVICE**
**Lester A. Morgan, 28 W. Main St., New Palestine, Ind.**
**Filed May 19, 1969, Ser. No. 825,669**
**Int. Cl. B25b 1/02, 1/24**
**U.S. Cl. 269—275** **12 Claims**




A holding device comprising first and second generally parallel rigid plates and a pad of resilient material sandwiched between the plates, the plates being bonded to opposite sides of the pad. Thus, the plates are resiliently connected for slight relative movement. One of the two plates may be split into at least two portions, each of which is resiliently connected to the other plate. The two portions provide jaws for gripping parts.

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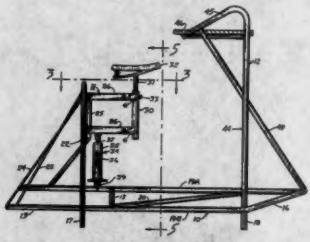
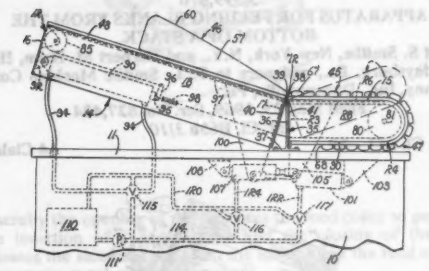
**3,599,962**
**ORTHOPEDIC'S CAST CHAIR**
**John P. Henry, Route 1 Lahoma Road, Enid, Okla.**
**Filed Sept. 11, 1968, Ser. No. 759,003**
**Int. Cl. A61g 15/00**
**U.S. Cl. 269—322** **2 Claims**



An orthopedic support apparatus of an adjustable chair type to aid in maintaining a person in appropriate position to allow bandaging and casting of various parts of the body and particularly of the lower extremities and torso. A seat adjustably positionable on a supporting frame maintains the patient in a sitting position with legs suspended and trunk substantially upright and without support members adjacent the lower extremities so that they may be freely operated upon.

3,599,963
EXAMINATION TABLE
Jacquelyne A. Grover, 153 E. Shaw Ave., Fresno, Calif.
Continuation-in-part of application Ser. No. 447,657, Apr. 13, 1965, now abandoned. This application Aug. 6, 1968, Ser. No. 750,697
Int. Cl. A61g *13/00*
U.S. Cl. 269—325 17 Claims



A patient examination table having a support frame comprising two sections which are mounted on a base and are actuated by hydraulic mechanisms. A longitudinally movable carriage means consisting of a rigid portion and a flexible portion formed from hinged slatlike members is mounted for movement on the tracks on the support frame sections. Hydraulic mechanisms are also provided to move the carriage means. A removable section is provided in the flexible portion to further facilitate examinations and provide greater access to examining areas.

A second form is provided which is driven by electric motors and gearing. The flexible portion of the movable carriage is replaced by a telescopic structure whereby the movable carriage passes over a fixed carriage portion.

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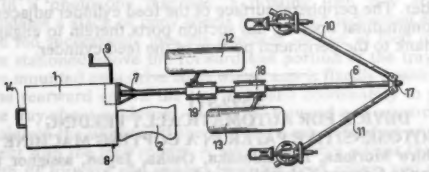
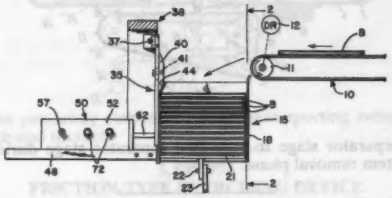
3,599,964
OPERATING TABLE
Gustav Albert Magni, Lidingo, Sweden, assignor to Jarnhs Elecktriska Aktiebolag
Filed June 26, 1969, Ser. No. 836,876
Claims priority, application Sweden, July 17, 1968, 9770/68
Int. Cl. A61g *13/00*
U.S. Cl. 269—328 4 Claims



An operating table for lower portions of the human body comprises a single bar that extends lengthwise from the table and carries supports for the legs and feet on either side of the bar. The supports are adjustable, those for the feet being universally mounted at the ends of a pair of arms that extend swingably from both sides of the bar on a holder that is movable lengthwise of the bar. The bar itself is movable transversely of its length, from side-to-side of the table, by means of a crank-operated slide.

3,599,965
CONTROL APPARATUS FOR BOOK HOPPER
Paul G. Humphrey, and Charles W. Bunting, both of Dayton, Ohio, assignors to The McCall Printing Company, Dayton, Ohio
Filed Aug. 7, 1969, Ser. No. 848,207
Int. Cl. B65h *3/24*
U.S. Cl. 271—3 5 Claims



Magazines are delivered to a hopper and are successively fed from the hopper onto a conveyor by an oscillating shuttle and a pair of driven pinch rolls. The shuttle is operated in timed relation with the conveyor through a clutch controlled by a pneumatic valve including a pistonlike valve member. A paddle senses the stack height of the magazine within the hopper and actuates the valve member. Air is continuously exhausted from the valve, and the flow rate of the exhausting air is adjustable to vary the stack height of the magazines within the hopper.

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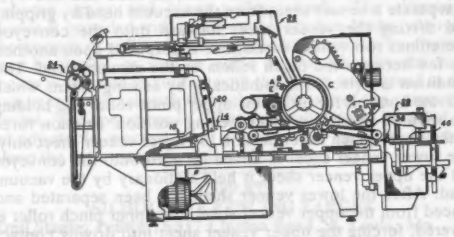
3,599,966
SHEET-HANDLING APPARATUS
George D. Del Vecchio, Briscoe Cove, North Rose, and Larry H. Warren, East Rochester, both of, N.Y., assignors to Xerox Corporation, Rochester, N.Y.
Filed June 2, 1969, Ser. No. 829,607
Int. Cl. B65h *1/28*
U.S. Cl. 271—9 8 Claims



An assembly for supporting two stacks of copy sheet material in a xerographic reproducing machine. The assembly includes an upper tray for supporting sheets of a first characteristic and a lower tray for supporting sheets of a second characteristic. The trays are movable together in a vertical plane while the upper tray is also movable in a horizontal plane to thereby permit the positioning of either stack beneath sheet-forwarding elements of the machine.

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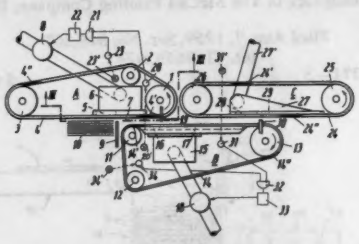
3,599,967
DEVICE FOR SEPARATING FLAT ITEMS SUCH AS MAIL FROM A STACK
Hans Rapparlie, and Werner Frank, both of Constance, Germany, assignors to Telefunken Patentverwertungsgeselischaft m.b.H., Ulm Danube, Germany
Filed Dec. 24, 1969, Ser. No. 887,932
Claims priority, application Germany, Dec. 27, 1968, P 18 17 101.2
Int. Cl. B65h *5/02, 7/12*
U.S. Cl. 271—12 6 Claims

A flat item separator composed of three alternately disposed, consecutive synchronized suction belts and an

abutment at the output of each of the first two belts, and means for causing the occurrence of a multiple removal by



any separator stage to stop that separator stage during the next item removal phase.

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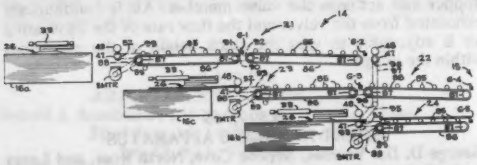
**3,599,968**
**VENEER-SHEET-FEEDING APPARATUS**
**Ronald J. Billett, Sunnyvale, and Terence H. West, San Jose, both of, Calif., assignors to FMC Corporation, San Jose, Calif.**
**Filed Dec. 24, 1969, Ser. No. 887,876**
**Int. Cl. B65h** *5/10*
**U.S. Cl. 271—14** **6 Claims**



In plywood layup apparatus, veneer sheets are fed from a vertical stack onto a horizontal conveyor by a movable vacuum head that grips the uppermost veneer sheet in the stack and shifts it towards the conveyor. A pair of pinch rollers are positioned between the vacuum head and conveyor to separate a veneer sheet from the vacuum head by gripping and driving the veneer sheet forward onto the conveyor. Sometimes two veneer sheets, one superposed upon another, are fed between the pinch rollers by the vacuum head. This condition is detected automatically by sensing means which activate controls for lifting the upper pinch roller and holding the vacuum head in a sheet-feeding position. Friction force of the lower pinch roller acts on the lower veneer sheet only. The lower veneer sheet is driven forward onto the conveyor but the upper veneer sheet is held stationary by the vacuum head. After the lower veneer sheet has been separated and spaced from the upper veneer sheet, the upper pinch roller is lowered, forcing the upper veneer sheet into driving contact with the lower pinch roller. Thus, the upper veneer sheet is separated from the vacuum head and driven forward onto the conveyor.

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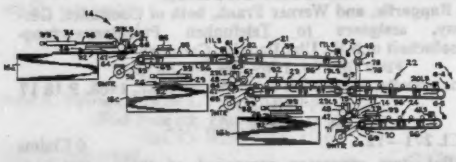
**3,599,969**
**VENEER SHEET SEPARATOR**
**Terence H. West, San Jose, Calif., assignor to FMC Corporation, San Jose, Calif.**
**Filed Dec. 24, 1969, Ser. No. 887,877**
**Int. Cl. B65h** *5/10*
**U.S. Cl. 271—14** **7 Claims**



Conveyors feed veneer sheets to a plywood assembly station in sequence for assembly. Sometimes two veneer sheets, one superposed upon another, are fed on one conveyor. Such a condition is automatically remedied by a veneer sheet separator formed by the conveyor and appurtenant equipment. The condition is detected automatically by sensing means which activate control means that are subsequently operated by a veneer sheet reaching a position on the conveyor and when operated actuate a vacuum head. One veneer sheet is gripped by the vacuum head while the other veneer sheet is forced downstream by the conveyor causing separation by shearing action between the veneer sheets.

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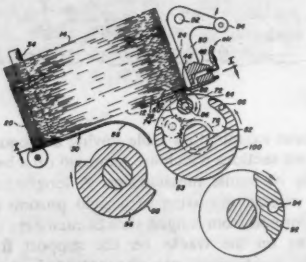
**3,599,970**
**APPARATUS FOR FEEDING BLANKS FROM THE BOTTOM OF A STACK**
**Eliot S. Smithe, New York, N.Y., and Herbert M. Helm, Hollidaysburg, Pa., assignors to F. L. Smithe Machine Company, Inc., Duncansville, Pa.**
**Filed May 23, 1969, Ser. No. 827,424**
**Int. Cl. B65h** *3/10*
**U.S. Cl. 271—29** **14 Claims**



A feeder mechanism is provided to feed envelope blanks having rectangular or triangular bottom flap portions from the bottom of a stack while maintaining register. A sucker shaft is rotatably mounted within a hollow feed cylinder that has an elongated longitudinal opening. The sucker shaft has radially extending protuberances that extend through the cylinder opening and beyond the periphery of the feed cylinder. The protuberances extend upwardly through the cutout segments of the feeder disc to a position adjacent the front edge of the bottom blank. The protuberances, by suction, engage the entire front end portion of the bottom blank while the front edge portion of the stack is supported by a support device. By rotation of both the feed cylinder and the sucker shaft at different peripheral speeds and in opposite directions, the front edge of the bottom blank is bent downwardly into the feed cylinder. An edge of the cylinder opening engages the blank upper surface and continues to bend the front end portion of the blank downwardly. A cylindrical pressure segment urges the blank against the peripheral surface of the feed cylinder to separate the bottom blank from the stack and feed the blank to an impression cylinder. The peripheral surface of the feed cylinder adjacent the longitudinal opening has suction ports therein to engage the blank to the peripheral portion of the feed cylinder.

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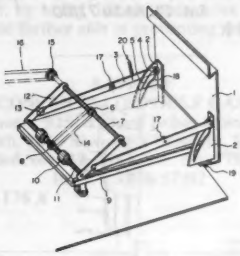
**3,599,971**
**DEVICE FOR AUTOMATICALLY FEEDING PHOTOSENSITIVE PAPER IN A COPYING MACHINE**
**Yukihiro Morioka, Higashiosaka, Osaka, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan**
**Filed June 19, 1969, Ser. No. 834,708**
**Claims priority, application Japan, July 10, 1968, 43/58766**
**Int. Cl. B65h** *3/06*
**U.S. Cl. 271—36** **4 Claims**

A mechanism facilitating the loading of a copying machine with a stack of paper includes a lid hinged to the machine wall and swingable between a vertical position exposing the opening. A feed roller is fixed to a first shaft rotatably supported at a point remote from the opening between sidearms which are swingable about an upper drive shaft which is belt coupled to the first shaft so that the feed roller is movable with the sidearms between a raised retracted position and a normally lowered advanced position. Cam members are mounted on the lid and levers pivoted between their ends for

swinging about a transverse horizontal axis have their inner ends engaging the underfaces of the sidearms and their outer ends provided with cam followers engaging the cams



whereby the opening of the lid raises the feed roller to permit the insertion of a paper stack and the closing of the lid releases the sidearms to permit the lowering of the feed roller into engagement with the top sheet.

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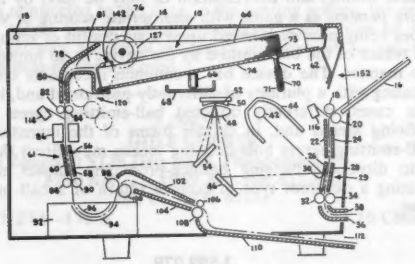
3,599,972

**PAPER TRAY FOR PHOTOCOPY MACHINE**

**Joseph F. Miciukiewicz, Trumbull, Conn., assignor to Pitney Bowes, Inc., Stamford, Conn.**

**Filed July 23, 1969, Ser. No. 844,094**
**Int. Cl. B65h *1/12***
**U.S. Cl. 271—39** **9 Claims**



In a photocopy machine, a floating feed tray accommodates a stack of copy sheets from which individual sheets are fed successively into the machine. A pair of feed rollers are stationed above the forward end portion of the tray and are mounted on a drive shaft whose axis is fixedly positioned. The rearward end of the tray is biased downwardly to pivot the tray about a fulcrum, urging the forward end upwardly to maintain the uppermost sheet of the stack in feeding engagement with the feed rollers. A latch releasably retains the tray with its forward end spaced from the feed rollers and sheet separator-edge alignment elements elevated to facilitate loading.

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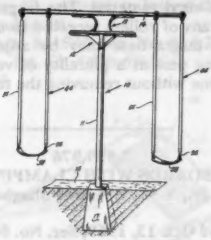
3,599,973

**PLAYGROUND SWING APPARATUS**

**Claude Wesley Ahrens, Grinnel, Iowa**

**Filed Apr. 16, 1969, Ser. No. 816,560**
**Int. Cl. A63g *1/32***
**U.S. Cl. 272—30** **3 Claims**

The swing apparatus has a hub assembly supported at the upper end of an upright column for rotation about a vertical axis. A horizontal beam member extended diametrically of the column and yieldably mounted on the hub assembly for rotational and horizontal tilting movement relative to the



column pendently carries an occupant supporting swing unit at each end thereof.

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3,599,974

**FRICTION-TYPE EXERCISING DEVICE**

**David D. Price, 3400 Harvey Parkway, Oklahoma City, Okla.**

**Filed Dec. 11, 1968, Ser. No. 783,037**
**Int. Cl. A63b *21/00, 21/20***
**U.S. Cl. 272—79 R** **11 Claims**

An improved exercising device whereby the person exercises by pulling a rope means extended generally over and between upper and lower pulley wheels. The exercising device is provided with an adjustable friction brake, whereby the amount of pulling force required to overcome the friction may be varied, as well as guide means, whereby the rope means is retained in contact with the pulley wheels and in the proper operational path throughout the use of the exercising device. The operations of lifting and pulling may be aided by an adjustable, pivoted hand grip member movably disposed along the rope means for selected affixture.

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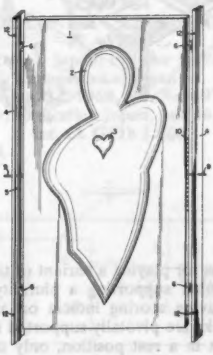
3,599,975

**SILHOUETTE FENCING TARGET**

**Emil Stanley Pellicer, 6317 Clayton Road, St. Louis,, Mo.**

**Filed May 17, 1968, Ser. No. 730,205**
**Int. Cl. A63b *69/02***
**U.S. Cl. 273—1 R** **4 Claims**



A silhouette fencing target being shaped to present the form of a human being including a heart shaped area, is pro-

vided on a target base. The target has the shape of a human and consists of foam material secured to the target base and covered with a vinyl material. The target base is vertically movable by means of rollers received in tracks on a support frame and the target base may be adjustably secured by means of locking pins at a plurality of vertical positions on the support frame without removing the target base from the frame.

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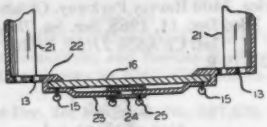
**3,599,976**

## GAME BOARDS WITH CLAMPING MEANS

**Paul S. Krajac, Jr., N-98, W-15844 Shagbard Road, Germantown, Wis.**

**Filed Oct. 13, 1969, Ser. No. 865,612**
**Int. Cl. A63b** *63/00*
**U.S. Cl. 273—85 R** **6 Claims**



This invention relates to a pair of devices for use on a table top or game board. They consist of bottom plates to be positioned on a table top, vertical boards extending from the bottom plates, clamping means to attach the boards to the table top and baskets supported by the vertical boards. The clamping means are such as to allow no relative movement between the pair of devices positioned opposite each other mounted on a table top. These devices may be used in play with balls, darts, or the like.

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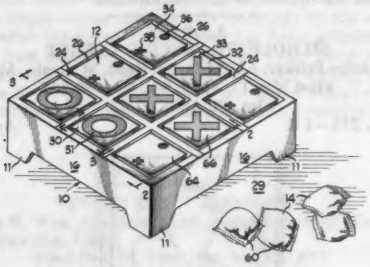
**3,599,977**

## ROTARY BLOCK TIC-TAC-TOE BOARD AND PROJECTILES

**Marvin I. Glass, and Burton C. Meyer, both of Chicago, Ill., assignors to Marvin Glass and Associates, Chicago, Ill.**

**Filed Mar. 17, 1969, Ser. No. 807,526**
**Int. Cl. A63b** *63/04*
**U.S. Cl. 273—95 R** **3 Claims**



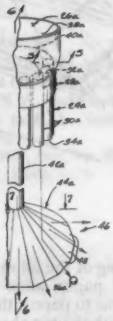
Game apparatus for playing a variant of tic-tac-toe including a frame member supporting a plurality of triangularly shaped blocks having scoring indicia on at least one face thereof. The blocks are pivotally supported in the frame in a manner such that in a rest position, only one face of each block is exposed to view. Projectile means are provided for throwing at any one of the blocks for turning the block and exposing a different block face to view.

**3,599,978**

## UNPREDICTABLE-RETURN BALL-FEEDING DEVICE

**Jorgen R. Sondergaard, 11032 Magnolia Blvd., North Hollywood, Calif.**

**Filed Jan. 13, 1969, Ser. No. 790,556**
**Int. Cl. A63b** *71/00*
**U.S. Cl. 273—95 R** **7 Claims**



A device for feeding one or more balls out of the device in an unpredictable manner so that one or more persons may attempt to catch or strike with the palm of the hand, a racket, a bat, or the like, the ball as it flies through the air in a manner which the player could not have predicted. In other words, the device develops a great deal of speed, coordination, and timing on the part of the person using it because of the unpredictable return nature of the ball-feeding device. The device may be used by a single person for improving his speed, timing, and coordination or may be used by two or more persons as a game with appropriate scoring of various types being provided, based upon a successful or unsuccessful return of the ball emitted by the device in an unpredictable manner. The device has a common receptacle communicating with a plurality of differently positioned and, in certain cases, differently directed ball-emitting egress hole-defining means and, in certain forms of the invention the ball-emitting egress hole-defining means may direct the ball onto direction-changing bounce-producing impact means, causing a different type of bounce return of a ball in each case.

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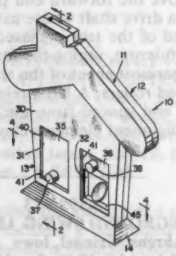
**3,599,979**

## FREE-CHOICE GAME

**Joseph A. Weisbecker, 1220 Wayne Ave., Erlton, Cherry Hill, N.J.**

**Filed Sept. 17, 1969, Ser. No. 858,586**
**Int. Cl. A63f** *7/02*
**U.S. Cl. 273—138 R** **5 Claims**



A game wherein a pellet is dropped into an upper opening in a housing for movement through a passageway into one of

a plurality of lower openings. Each lower opening has a closure or door to initially conceal the pellet and the floor of the opening slopes downwardly away from the closure. This sloping, by biasing the pellet away from the door, helps to prevent detection of the particular door concealing the pellet. The pellet, by being disc shaped, saves overall depth in the housing and further aids in preventing detection.

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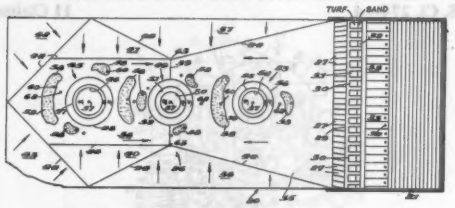
**3,599,980**
**CONCENTRATED GOLF GAME**
**Jesse E. Harmond, 925 Witham Drive, Corvallis, Oreg., and Jack O. Smith, 1059 Shamrock Drive SE, Salem, Oreg.**
**Filed Nov. 22, 1968, Ser. No. 778,106**
**Int. Cl. A63b** *67/02*
**U.S. Cl. 273—176 A** **5 Claims**




A golf course including an enclosed area at one end of an elongated fairway. The enclosed area includes driving tees, ball dispensers, turf for chipping shots, sand traps, putting greens and bleachers for spectators. The fairway is generally dish-shaped and includes a plurality of target greens. Balls are returned to the dispensers at the tees by a pneumatic system connected to the cups in the putting greens, the cups in the target greens and an opening at a low point of the dished fairway. Electrical indicators are provided to indicate when a hole-in-one is scored.

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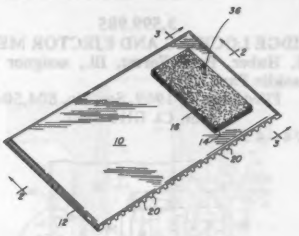
**3,599,981**
**GOLF COURSE**
**Joseph Zausmer, 9126 Dale Road, Philadelphia, Pa.**
**Filed Apr. 21, 1969, Ser. No. 817,855**
**Int. Cl. A63b** *67/02*
**U.S. Cl. 273—176 A** **10 Claims**

A system for accurately determining the distance a golf ball has traveled from a tee comprising a zero base marker mounted on the tee, and at least one fairway marker mounted in the fairway with the distance from the base marker appearing on the fairway marker, said markers being mounted flush with the ground and including a base plate, a plurality of pins extending downwardly from the base plate and having a cone-shaped barb on the end for anchoring the base plate in the ground, numerals extending upwardly from the base plate to indicate distance, a top plate, a pair of bosses extending upwardly from the bottom plate and having outwardly projecting sidewalls, a pair of recesses formed in the upper plate and having inwardly flaring sidewalls, said recesses being adapted to receive said bosses to hold the plates together, and a window formed in the top plate and adapted to frame the numerals in the bottom plate. A second fairway marker may be mounted in the fairway and may have the distance from the middle of the green appearing thereon.

**3,599,982**
**GOLF-PRACTICE MAT**
**Joseph Elesh, Skokie, Ill., assignor to International Recreation Products, Inc., Skokie, Ill.**
**Filed Apr. 8, 1969, Ser. No. 814,286**
**Int. Cl. A63b** *69/36*
**U.S. Cl. 273—195 A** **2 Claims**



A practice mat for golfers of rubber of substantial length and width, containing no metal parts and having a cavity in one end of the face of the mat containing a brush removably secured in said cavity and to said mat and the brush having an upstanding rubber tube extending from the lower portion of the rubber mat upwardly through the brush and extending upwardly above the brush surface, whereby golf iron shots may be practiced from the brush surface and golf wood shots may be practiced using the rubber tube.

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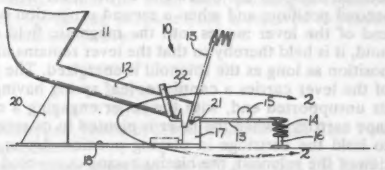
**3,599,983**
**GOLF BALL DISPENSER**
**Raymond L. Melton, 8556 Newcastle Ave., Los Angeles, Calif.**
**Filed July 11, 1969, Ser. No. 841,049**
**Int. Cl. A63b** *57/00*
**U.S. Cl. 273—201** **10 Claims**



A golf ball dispenser disclosed herein having a hopper for storing a quantity of balls and a pivoting ramp mounted on a fulcrum base for receiving a ball from the hopper for delivering to a playing tee. The device includes a selector means for introducing one ball at a time to the ramp and the end of the ramp mounts a helical guide for placing the selected ball directly onto the tee. Counterweights are carried on the ramp on one side of the fulcrum base so as to pivot the ramp to an upright position out of the club-swinging path.

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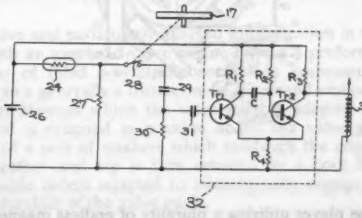
**3,599,984**
**AUTOMATIC CONTROL DEVICE FOR RECORD PLAYERS**
**Tatsuo Kondo, Tokyo, Japan, assignor to Victor Company of Japan, Limited, Kanagawa-ku, Japan**
**Filed Jan. 12, 1968, Ser. No. 697,520**
**Claims priority, application Japan, Jan. 16, 1967, 42/2678**
**Int. Cl. G11b** *17/06*
**U.S. Cl. 274—1 L** **7 Claims**



An automatic control device for record players which is operatively connected to a pickup arm for converting a varia-

tion in the rate of movement of the pickup arm into a change in voltage to thereby detect the position of the leadout groove of a record. The device operates in response to the detected output voltage change to restore the pickup arm to its original position.

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**3,599,985**

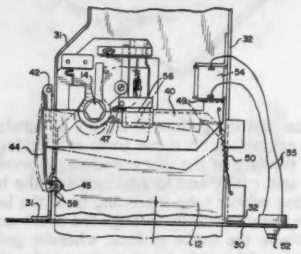
**CARTRIDGE LOCKING AND EJECTOR MECHANISM**

**William B. Huber, Park Forest, Ill., assignor to Motorola, Inc., Franklin Park, Ill.**

**Filed Mar. 5, 1969, Ser. No. 804,504**

**Int. Cl. G11b** *5/00*

**U.S. Cl. 274—4 B** **10 Claims**



A tape locking and ejector mechanism for cartridge-tape players comprises a lever carrying intermediate the ends a first projection which extends into the path of movement of a cartridge when inserted into the apparatus. The lever is pivoted at one end; so that when the cartridge engages the projection, the lever is pivoted from a first position to which it is spring biased to a second position. A holding solenoid is located adjacent the other end of the lever when it is at the second position; and when a second projection on this other end of the lever moves into the magnetic field of the solenoid, it is held thereby so that the lever remains in the second position as long as the solenoid is energized. The pivoted end of the lever carries a cantilever leaf spring having a roller at its unsupported end, with the roller engaging a notch in the tape cartridge when the lever is pivoted to its second position to hold the cartridge in playing position. Upon deenergization of the solenoid, the biasing spring connected to the lever operating in conjunction with the leaf spring, pulls the lever back to its first position, causing the tape cartridge to be ejected and causing the spring-biased roller to be disengaged from the notch in the cartridge.

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**3,599,986**

**TAPE PLAYER UTILIZING PLURALITY OF ENDLESS MAGNETIC TAPE CARTRIDGES**

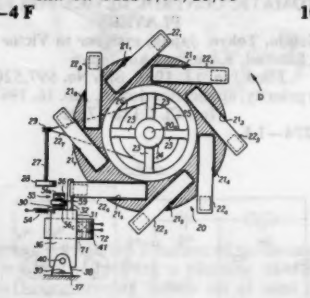
**Itsuki Ban, 829, Higashi-Oizumimachi, Nerima-ku, Tokyo-to, Japan**

**Filed Oct. 30, 1968, Ser. No. 771,720**

**Claims priority, application Japan, Oct. 28, 1967, 42/69004**

**Int. Cl. G11b** *5/00, 23/06*

**U.S. Cl. 274—4 F** **10 Claims**



A tape player utilizing a plurality of endless magnetic tape cartridges comprising a container housing a plurality of endless magnetic tape cartridges therein, means for indexing the cartridge housed in the container and the sound track by depressing pushbutton rods whereby rotation of the container is controlled by said means to bring the preindexed cartridge into the play position while a magnetic head is caused to be moved to the preindexed soundtrack for its reproducing as desired so that the indexed cartridge and track are played in succession according to the programs.

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**3,599,987**

**SELECTOR AND REPRODUCER FOR A PLURALITY OF ENDLESS TAPE CARTRIDGES**

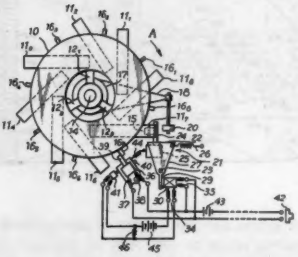
**Itsuki Ban, 829 Higashi-Oizumimachi, Nerima-ku, Tokyo-to, Japan**

**Filed May 28, 1968, Ser. No. 732,678**

**Claims priority, application Japan, May 29, 1967, 42/44713**

**Int. Cl. B65h** *19/00;* **G11b** *15/66;* **G03b** *21/04*

**U.S. Cl. 274—4** **11 Claims**



An endless tape player comprising a housing storing therein a plurality of cartridges each receiving an endless tape therewithin, capstan means engageable and disengageable with a pinch roller stored in each cartridge for controlling a tape feed, cartridge-selecting means for controlling rotation of said housing to bring the cartridge to be reproduced into a position opposite to said capstan, an indicator for making sure of the presence of the cartridge during reproducing, whereby one of the plurality of cartridges is selectively taken out of each cartridge for tape reproduction.

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**3,599,988**

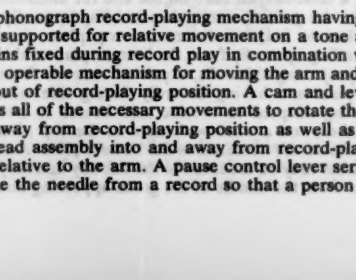
**SEMIAUTOMATIC PHONOGRAPH WITH RADIAL ARM**

**Elwood G. Norris, Seattle, Wash., assignor to Elwood G. Norris**

**Continuation-in-part of application Ser. No. 785,555, Dec. 20, 1968, which is a continuation-in-part of application Ser. No. 600,338, Nov. 15, 1966, now Patent No. 3,418,435, which was a continuation-in-part of Ser. No. 389,838, Aug. 17, 1964. This application Dec. 15, 1969, Ser. No. 884,883.**

**Int. Cl. G11b** *17/06, 3/10*

**U.S. Cl. 274—9 R** **13 Claims**



A phonograph record-playing mechanism having a pickup head supported for relative movement on a tone arm which remains fixed during record play in combination with selectively operable mechanism for moving the arm and head into and out of record-playing position. A cam and lever system causes all of the necessary movements to rotate the arm into and away from record-playing position as well as for tilting the head assembly into and away from record-playing position relative to the arm. A pause control lever serves to disengage the needle from a record so that a person can inter-

rupt the playing of a record at one instant in time and then at a later time reengage the needle with the exact groove from which it was previously disengaged. A single pushbutton switch controls an electric circuit in a manner which initiates the playing of a record and also serves to control a reject cycle. The apparatus is usable for playing records of different diameters.

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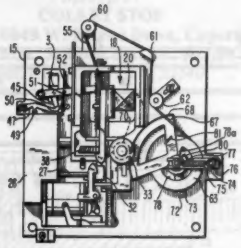
3,599,989
MEASURED REVIEW FOR DISC-TYPE DICTATION APPARATUS

Henry R. Kruspe, and Norwood Kenneth Perkins, both of Lexington, Ky., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 17, 1969, Ser. No. 877,313
Int. Cl. G11b 25/04
U.S. Cl. 274—14 10 Claims



The invention concerns dictation apparatus making use of disc-type record media for the recording and reproducing of audio signals and particularly concerns mechanisms for effecting a desired standard amount of review of previously dictated material irrespective of the relative location of a sound transducer with respect to the disc. Customarily, in a disc-type apparatus, means are provided for relatively moving a transducer with respect to the disc media to trace a spiral sound track from the outer portion of the disc toward the inner portion. This may result in a variance in the amount of material that is reviewed during each operation of an associated review or backspace mechanism, and the present invention concerns itself with establishing a standardized increment of review in such apparatus.

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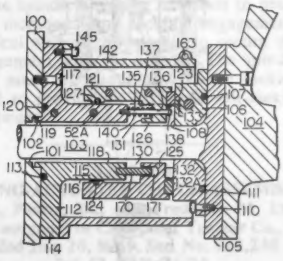
3,599,990
SHAFT SEAL

Harold Frederic Greiner, and Walter William Meyer, both of Warwick, R.I., assignors to Sealol, Inc., Warwick, R.I.

Division of Ser. No. 688,140, Dec. 5, 1967, Pat. No. 3,529,839.
Filed Oct. 13, 1969, Ser. No. 865, 623
Int. Cl. F16j 15/54; B63n 1/00
U.S. Cl. 277—4 2 Claims



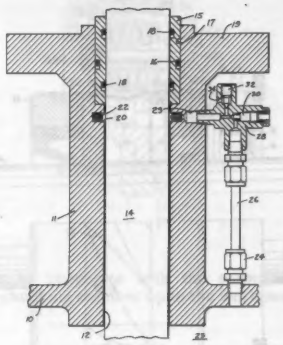
This invention relates to split-type face seals for use with oil-lubricated surface vessel stern tube bearings.

The present invention relates to mechanical rotary-type fluid seals and more particularly to an interface-type rotary fluid seal having a rotating mating ring and a stationary sealing thrust ring for use with oceangoing surface vessels.

3,599,991
AUXILIARY VALVE STEM SEAL

Marvin G. Combes, Castro Valley, and Roger L. Ripert, Concord, both of, Calif., assignors to Grove Valve and Regulator Company, Oakland, Calif.

Filed Oct. 31, 1969, Ser. No. 873,034
Int. Cl. F16j 9/00; F02f 11/00
U.S. Cl. 277—9 5 Claims



An auxiliary valve stem seal which permits removal and replacement of the main stem packing. An elastomeric ring around the stem inward of the main packing is normally of an inner diameter larger than the stem so that it is ineffective as a seal. A pressure fluid is selectively introduced around the seal ring, causing it to deform to a smaller diameter and seal around the stem. When the main stem packing is repaired and replaced, the sealing pressure fluid is relieved to render the auxiliary seal ineffective.

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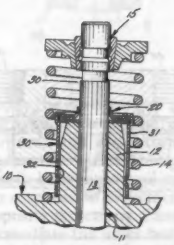
3,599,992
VALVE SEAL

John H. Kammeraad, Holland, Mich., assignor to K-Line Tool Co., Holland, Mich.

Continuation of application Ser. No. 675,586, Oct. 16, 1967, now abandoned. This application May 7, 1970, Ser. No. 37,385
Int. Cl. F16j 15/00; F16k 41/00
U.S. Cl. 277—48 7 Claims



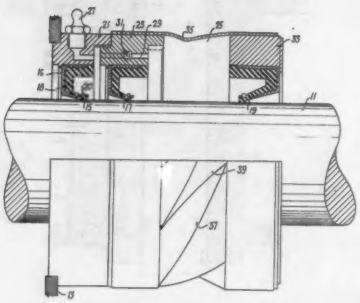
A valve seal particularly adapted for utilization in conjunction with an overhead valve engine having a preformed seal member of filled polytetrafluoroethylene embossed or extruded to a generally a frustoconical shape and embodying an aperture through which the valve stem is adapted to slide. The seal is retained in position above the valve guide by means of a pair of washers which sandwich the edge of the seal together and are in turn retained by a boot having a deformable indent adapted to telescopically engage the exposed shoulder of the valve guide.

3,599,993

## DEVICE FOR SEALING OF A ROTARY SHAFT

Bror Allan Eriksson, Karlstad, Sweden, assignor to Skega Aktiebolag, Skelleftea, Sweden

Filed Jan. 28, 1970, Ser. No. 6,391
Claims priority, application Sweden, Jan. 29, 1969, 1150/69
Int. Cl. F16j *108*
U.S. Cl. 277—59 10 Claims



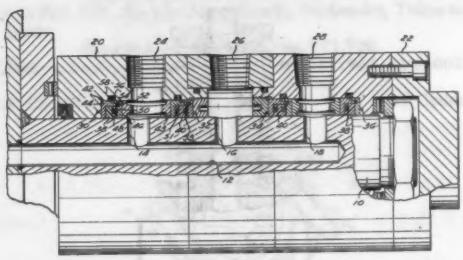
A sealing device is disclosed, wherein a rotary shaft is sealed to a stationary housing or similar. A sealing means engaging the shaft is somewhat movable with the shaft in the peripheral direction. Said sealing means is held by a flexible sleeve which is shortened when twisted. The sleeve encloses a supply of lubricant that is put under raised pressure when the sleeve is twisted, thereby preventing undesired passage of particles or fluids past the sealing means.

3,599,994

## SHAFT SEAL FOR ROTATING SHAFT

William L. Komph, Sr., Port Huron, Mich., assignor to McDowell-Wellman Engineering Company, Cleveland, Ohio

Filed Jan. 21, 1970, Ser. No. 4,559
Int. Cl. F16j *15/16*
U.S. Cl. 277—136 12 Claims



There is provided an improved shaft seal especially adapted for use on a rotating shaft, and characterized by a seal ring, a channel-form circular seal member disposed between the channel-form retainer and the seal ring, and locking means coacting between the seal ring and the channel-form seal retainer.

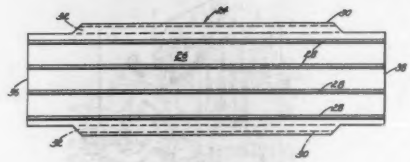
In a specific embodiment, the seal ring is provided with a key member or plurality thereof, and the seal retainer is provided with keyways which coact in assembly to prevent relative rotation of the seal ring with respect to the seal retainer. In addition, the seal ring is structured at its outer radial extremities to closely abut the channel-form seal retainer so as to provide an antitipping configuration.

3,599,995

## SEALING GASKET AND PIPE REPAIR CLAMP

Michael J. Rafalski, Jr., 602 S. Falcon St., and Blase G. Celmer, 506 Koszciuszko St., both of South Bend, Ind.

Filed June 26, 1969, Ser. No. 836,800
Int. Cl. F16j *15/06*
U.S. Cl. 277—208 3 Claims



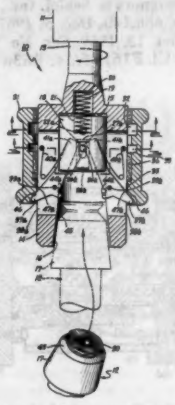
A band clamp and sealing gasket for use in repairing a pipe is provided which has a plurality of beads extending circumferentially about the inner surface of the gasket. The beads perform the sealing function to seal the leak in the pipe. The gasket is also provided with a lip extending around each side thereof, having a groove which engages the band clamp to maintain the gasket in position during transportation and application, but which will allow the gasket to flow during the clamping operation to repair a leak.

3,599,996

## TOOLHOLDER FOR A MACHINE TOOL

Donald G. Holt, 500 29th Ave., Oakland, Calif.

Filed June 25, 1969, Ser. No. 836,668
Int. Cl. B23b *31/10*
U.S. Cl. 279—1 B 19 Claims



A toolholder for machine tools such as boring mills and the like to enable quick and ready interchange of tool implements therefor while the machine tool is in operation. The holder includes a rotatable spindle adapted to be continu-

ously driven by such machine tool, and it is provided with an axially extending passage open at one end for receipt of a tool implement therein. Retainer structure selectively movable between tool-confining and tool-release positions is controlled by an operator element rotatably mounted upon the spindle and slidably displaceable relative thereto to control the position of the retainer structure. A driver mounted within the spindle passage is forced to rotate with the spindle but is selectively movable relative thereto under the control of the operator between an operative position in which it drivingly engages the tool implement and an inoperative position released therefrom. The operator element thereby controls both the retainer structure and driver, and it can be moved between its open and closed positions to permit removal and replacement of tool implements with the machine tool in operation.

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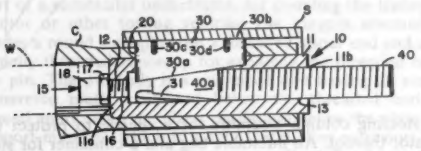
**3,599,997**
**COLLET STOP**
**Clark E. Oliver, 10849 W. Estates Drive, Cupertino, Calif.**
**Filed Mar. 3, 1969, Ser. No. 803,607**
**Int. Cl. B23b** *31/20, 31/40*
**U.S. Cl. 279—1 S** **12 Claims**




The collet stop comprises a cylindrical body, which is received by a conventional collet. One end of the body is formed with an internally threaded bore for receiving in threaded engagement a solid work stop. Formed in the body are a plurality of axially extending slots. Disposed within the slots are detachable, axially extending, spindle-engaging members. A plurality of O-rings received in peripheral grooves on the body and in the detachable members yieldably hold the spindle-engaging members in position on the body. The spindle-engaging members extend inwardly into the body and project outwardly from the body. The surfaces of the spindle-engaging members disposed within the body are tapered in the axial direction so as to be inclined inwardly as the spindle-engaging members progress toward the work stop end of the body. The surfaces of the spindle-engaging members projecting outwardly from the body, which engage the inner cylindrical wall of a spindle, project equidistant from the outer cylindrical wall of the body. When the collet stop is disposed within the collet that is received by a spindle of a lathe or other machine, the spindle-engaging members project through axially extending slots formed in the collet and engage the inner cylindrical wall of the spindle. A locking screw with a tapered end is received by the other end of the collet stop, which tapered end engages the tapered surfaces of the spindle-engaging members to press the spindle-engaging members into locking engagement with the inner cylindrical wall of the spindle to secure the collet in locking engagement with the spindle. The spindle-engaging members are made of aluminum and the locking screw is made of steel to provide an improved self-locking engagement therebetween.

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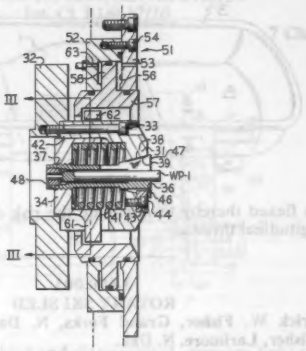
**3,599,998**
**SPRING-ACTUATED CHUCK ASSEMBLY**
**Jozef Kiwalle, Peoria, Ill., and Frederick M. Lamb, South Bend, Ind., assignors to Caterpillar Tractor Co., Peoria, Ill.**
**Filed July 16, 1969, Ser. No. 842,240**
**Int. Cl. B23b** *31/20*
**U.S. Cl. 279—51** **10 Claims**

A chuck assembly including a first ring element secured to a base structure such as a spindle with a second ring element being movable relative to the first element. A chucking element or collet sleeve is associated with one element and arranged for interaction with the other element so that the chucking member is actuated for engaging a workpiece by spring means acting between the two elements. The chucking member is preferably designed with a backup plate permitting axial forces applied to the chucking member through




the workpiece to cooperate with the spring for further tightening the chucking member upon the workpiece.

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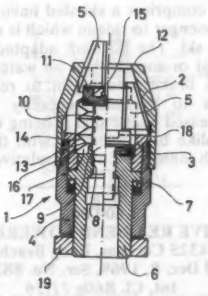
**3,599,999**
**CHUCK**
**Albrecht Schnizler, Nurtingen-Wurttemberg, and Hermann Kieser, Nurtingen-Oberensingen, both of, Germany, assignors to Metabowerke KG Closs, Rauch & Schnitzler, Nurtingen/Wurttemberg, Germany**
**Filed Nov. 21, 1969, Ser. No. 878,652**
**Claims priority, application Germany, Nov. 23, 1968, P 18 10 614.4**
**Int. Cl. B23b** *31/12*
**U.S. Cl. 279—60** **10 Claims**




A tubular outer body has an open end and an inner body is threadedly received in the outer body for movement in opposite directions towards and away from the open end. A plurality of jaws are provided in the outer body adjacent the open end and movable between a tool-engaging and a tool-releasing position in response to movement of the inner body in the respective opposite directions. Elastic sealing means in the outer body intermediate the inner body and the jaws protects the inner body against entry of contaminants.

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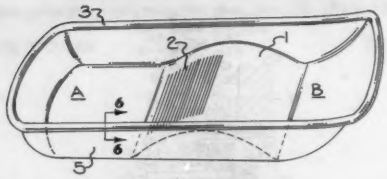
**3,600,000**
**SECURITY DEVICE FOR SLED**
**Kjell Bergstrom, Dobelnsgatan 22B, and Hakan Jorulf, Murklevagen 29, both of Uppsala, Sweden**
**Filed Mar. 20, 1969, Ser. No. 808,741**
**Claims priority, application Sweden, Mar. 21, 1968, 3792/68**
**Int. Cl. B62b** *13/04*
**U.S. Cl. 280—18** **3 Claims**

A security arrangement in and for a sled of the type to be used by small children, comprising an integral or attached

hump portion forcing the occupant of the sled to sit with the



legs flexed thereby to eliminate the risk of fractures due to longitudinal thrusts.

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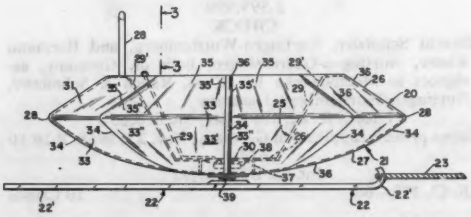
**3,600,001**
**ROTARY SKI SLED**
**Patrick W. Fisher, Grand Forks, N. Dak., and James A. Fisher, Larimore, N. Dak.**
**Filed June 18, 1969, Ser. No. 834,354**
**Int. Cl. B62b** *13/00*
**U.S. Cl. 280—24** **3 Claims**



The invention comprises a ski sled having a dishlike body member for a passenger to ride in which is rotatably mounted centrally upon a ski. The ski sled, adapted to be towed behind either a boat or snowmobile on water or snow respectively and has a brake mechanism to releasably lock the dishlike member to the ski, whereby when the brake mechanism is released as the sled is being towed the engagement of the dishlike body member with the towing surface will cause the dish member to rotate relative to the ski.

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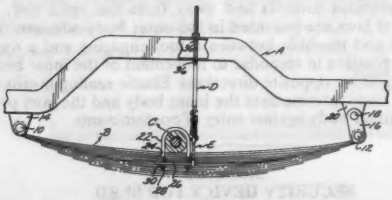
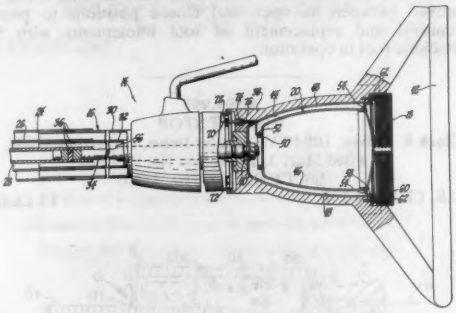
**3,600,002**
**AUTOMOTIVE REAR END LOWERING DEVICE**
**Dale D. Benwell, 4325 Cerritos, Long Beach, Calif.**
**Filed Dec. 8, 1969, Ser. No. 883,110**
**Int. Cl. B60g** *11/36*
**U.S. Cl. 280—124** **6 Claims**



A pair of spring-loaded devices that may be removably mounted in laterally spaced relationship on an automotive vehicle having a semielliptic leaf spring supported rear axle housing to lower the rear end portion of said vehicle relative to the rear wheels thereof and impart a desired customized appearance to said vehicle, as well as improving the cornering ability and riding qualities of the vehicle.

**3,600,003**
**VEHICLE SAFETY SYSTEM**
**William R. Carey, Farmington, Mich., assignor to Eaton Yale & Towne, Inc., Cleveland, Ohio**
**Continuation of application Ser. No. 625,518, Mar. 23, 1967, now abandoned. This application Mar. 19, 1969, Ser. No. 808,704**
**Int. Cl. B60r** *21/08*
**U.S. Cl. 280—150 AB** **12 Claims**



A steering column assembly for a vehicle to protect the operator thereof. An inflatable bag and a container for storing fluid for inflating the bag removably disposed as a unit within a recess in the assembly. The bag includes means comprising a rupturable patch for dissipating the energy resulting from movement of an operator against the inflated bag, thereby minimizing rebound of the operator. The steering column includes multiple overlapping components which are interconnected by shearpins and the container is disposed in the recess so that as fluid flows from the container to inflate the bag, a thrust is created on the column to shear the shearpins and collapse the column as the bag is being inflated.

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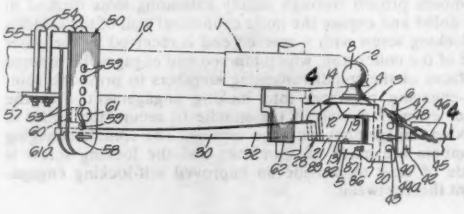
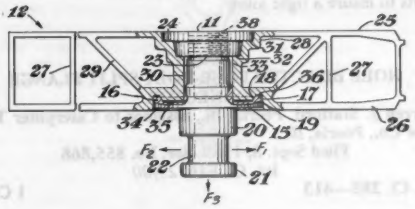
**3,600,004**
**TRAILER COUPLING DEVICE**
**Clarence E. Newkirk, 2265 S.E. Main St., Santa Ana, Calif.**
**Filed Nov. 3, 1969, Ser. No. 873,210**
**Int. Cl. B62d** *53/00*
**U.S. Cl. 280—406 A** **18 Claims**



A coupling device for connecting a trailer to a towing vehicle by means of a ball and socket connection, employs first and second pivotally connected control elements, one secured relative to the towing vehicle and the other connected by diverging spring bars to elements of the trailer frame. A shank carrying the ball serves as a pivot pin connecting the control elements, the latter having cooperating contacting surfaces shaped to permit relative pivoting movement about the shank axis. Cam means on the contacting surfaces are shaped to cause relative tilting movement between the control elements upon relative pivotal movement about said axis. The contacting surfaces may be conical or otherwise shaped as a part of a surface of revolution about said axis.

3,600,005
**KINGPIN AND SUPPORT MEMBER FOR A SEMITRAILER RIG**
Gordon K. Glaza, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.
Filed Dec. 19, 1969, Ser. No. 886,659
Int. Cl. B62d 53/08
U.S. Cl. 280—433 9 Claims



A kingpin assembly and support member is provided, as part of a semitrailer underframe, for coupling the trailer to a tractor or other towing vehicle. The kingpin assembly includes a round steel pin with a threaded upper end and an internally threaded screwcap for engaging the threaded end of the pin. The pin body is a one-piece unit having an annular transverse plate positioned below the threaded end and spaced apart collar members positioned below the plate. The support member, which is a light metal alloy extrusion, such as aluminum or magnesium, is generally defined by spaced apart transverse deck sections joined by upstanding struts positioned between the decks. A heavy-duty strut in the support member has a vertical opening therein conforming to the shape of the kingpin and screwcap, to enable the kingpin to be removably fastened into the support member with the screwcap.

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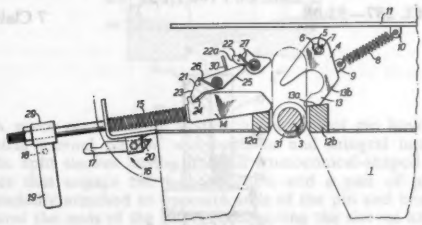
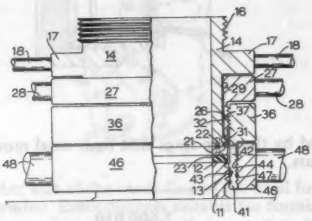
3,600,006
**COUPLINGS FOR TRAILERS**
John Greenwood Slaven, 17 Queen Victoria Avenue, Toronto 6, Ontario, Canada
Filed June 12, 1969, Ser. No. 832,726
Claims priority, application Great Britain, June 12, 1968, 27,858/68
Int. Cl. B62d 53/08
U.S. Cl. 280—434 4 Claims



A coupling for mounting on one vehicle for receiving the coupling pin of another vehicle, the coupling including a hook which is pivotally mounted on one side of an entrance slot in the coupling through which the coupling pin will pass and a locking member which is held in a withdrawn position to one side of the entrance slot by a separate latch member the locking member is arranged to move into an engaged position in which it holds the hook firmly around the pin which has passed through the entrance slot when a pin moves into the entrance slot and rotates the hook. The rotation of the hook moves the latch and releases the locking member which moves under the action of a bias into the locking position.

3,600,007
**FIREHOSE CONNECTOR**
Charles O. Morris, 5613 Layton Drive, North Highlands, Calif.
Filed Nov. 19, 1969, Ser. No. 878,139
Int. Cl. F16l 37/10
U.S. Cl. 285—35 7 Claims



A rapidly assembled and disassembled, pressure tight connection of a firehose to a hydrant or the like is made even if the threads of the outlet pipe of the latter are damaged or do not exist. A slotted, clamping sleeve receives a clamping nut on its external threads, and when the nut is tightened the slotted end of the clamping sleeve engages the outlet pipe. A hose connector carries an enlarged external diameter collar faced with a gasket which bears against the end of the outlet pipe and the gasket is forced thereagainst by a threaded body which engages internal threads on the clamping sleeve. The hose connector swivels inside the body until the collar is tightened against the end of the outlet pipe.

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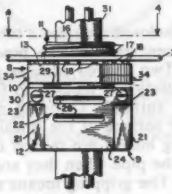
3,600,008
**SELF-LOCKING OUTLET BOX CONNECTOR**
Robert L. Barry, 2916 E. Randolph Road, Silver Spring, Md.
Filed July 25, 1969, Ser. No. 844,802
Int. Cl. F16l 35/00
U.S. Cl. 285—39 8 Claims



A connector for securing various types of electrical conduit to various types of electrical fixtures, such as, outlet boxes, which is capable of being applied manually to an opening of a wall of the box or fixture without the use of any tool, and which requires no separate fastening for securing the connector in the wall opening. The connector is secured in the box wall opening by a twisting force exerted thereon, is advanced through the opening by threadlike elements of the connector, and includes teeth or prongs which are brought into engagement with a surface of the wall, surrounding the opening, to retain the connector against detachment from the box opening by a normal twisting force exerted in the opposite direction.

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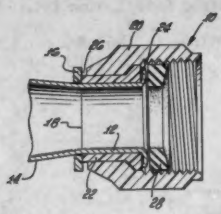
3,600,009
**FLEXIBLE CONNECTOR HAVING UNION NUTS**
Samuel Shupper, North Hollywood, Calif., assignor to Jerome Feig, Trustee d/b/a Great American Manufacturing and Sales Co., Pacoima, Calif.
Filed Aug. 28, 1969, Ser. No. 853,700
Int. Cl. F16l 19/02, 59/00
U.S. Cl. 285—52 3 Claims

Seal washers frictionally received within the threads of

union nuts are kept in place and prevented from being



dislodged by the stop rings that limit axial movement of the union nuts.

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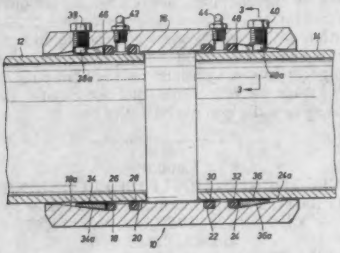
**3,600,010**
**PIPE COUPLING**

George F. Downs, III, San Antonio, Tex.; Burton Ver Nooy, Tulsa, Okla., and William R. Gwartney, Jr., Houston, Tex., assignors to T. D. Williamson Inc., Tulsa, Okla.

Filed Apr. 1, 1969, Ser. No. 811,762
Int. Cl. F16l *17/00*
U.S. Cl. 285—96 2 Claims



The coupling disclosed includes a tubular housing for sliding over the adjacent ends of two pipe sections to be connected together. Two spaced annular portions of the inner surface of the housing are tapered to form two facing conically shaped cam surfaces. Gripping means are positioned between the inner surface of the housing and the pipe sections. The gripping means are moved inwardly into holding engagement with the pipe when they are moved axially along the cam surfaces. The gripping means are so moved by seal members, which in turn are operately moved axially by pressure from the line or an external source.

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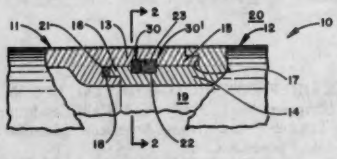
**3,600,011**
**JOINT UTILIZING WEDGE-SHAPED RECTANGULAR LOCKING SHAFTS**

Robert L. Alvis, Albuquerque, N. Mex., assignor to The United States of America as represented by the United States Atomic Energy Commission

Filed Sept. 19, 1969, Ser. No. 859,469
Int. Cl. F16l *37/00*
U.S. Cl. 285—305 5 Claims



A lightweight locking joint between two annularly or cylindrically shaped members in which at least one interfitting tongue and groove joint between the respective members is held in mating relationship by at least one set of two wedge-shaped rectangular shafts inserted into a common rectangular channel between the members through tangential access holes thereto, the common channel being formed by the telescopic juxtaposition of a partial channel in each member, each locking shaft wedging against the other of its set after sequential insertion of the shafts in oppositely disposed relationship in the channel filling the channel with the wedged shafts to insure a tight joint.

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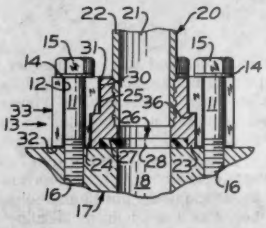
**3,600,012**
**HOLE BISECTED FOUR-BOLT SPLIT FLANGE CONNECTOR**

Warren J. Stafford, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Sept. 8, 1969, Ser. No. 855,868
Int. Cl. F16l *23/00*
U.S. Cl. 285—413 1 Claim



A four-bolt split flange connector for assembling fluid couplings to associated structures is diagonally bisected through two of its four bolt holes and its center so that each of the identical arcuate flange sectors includes a centrally disposed bolt hole and two half holes at its ends which join with those of the other sector to form four bolt holes. Thus, each of the sectors is secured with three bolts of the four attaching bolts when, for securing a coupling to associated structures, operating at high pressures.

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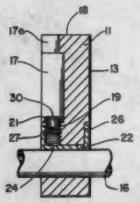
**3,600,013**
**ROTOR ASSEMBLY**

John P. Doering, Jr., Santa Ana, Calif., assignor to Beckman Instruments, Inc.

Filed Mar. 16, 1970, Ser. No. 19,618
Int. Cl. F16d *1/06*
U.S. Cl. 287—52.08 7 Claims



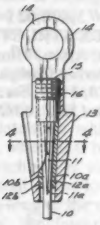
A rotor assembly for attaching a rotor member to a rotatable shaft including a shaft opening through which is positioned a rotary shaft. A U-shaped retainer is also positioned through the shaft opening between the shaft and the sidewall of the opening with one leg of the U-shaped retainer positioned against a rear surface of the rotor block and the other leg of the retainer positioned within a slot formed in the front face of the rotor block. Within the slot, between the leg of the retainer and the sidewall of the slot is positioned a setscrew which engages threads formed in the sidewall of the slot, the setscrew bears against the base of the retainer forcing it against the shaft thereby locking the rotor into place against the shaft.

3,600,014

## MECHANICAL END FITTINGS FOR TENSION RODS

Thomas Harris, Chesterland, Ohio, assignor to The Glastic Corporation, South Euclid, Ohio

Filed July 28, 1969, Ser. No. 845,178
Int. Cl. F16g 11/00
U.S. Cl. 287—83 9 Claims



An end fitting and method for tensioning a plastic rod having longitudinal reinforcing fibers; an end portion of the rod being split, and the split end portions being separated by a wedge to form a first subassembly; slightly separated halves of a frustoconical split ferrule being applied to embrace the first subassembly from opposite sides thereof to form a second subassembly; the second subassembly being forcibly seated in a frustoconical bore of an outer fitting body adapted to be connected to a tension load; and a plug being threaded into said body to engage the parts of the second subassembly adjacent the large end of the bore of said body for driving them together into mutually wedged relationship in said body and developing high frictional pressures between mating tapered surfaces of the parts of the final assembly and for holding those parts against reverse movement.

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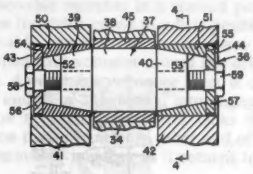
3,600,015

## PIVOT PIN STRUCTURE

Larry Gene McMullen, East Moline, Ill., assignor to Deere & Company, Moline, Ill.

Continuation of application Ser. No. 625,197, Mar. 22, 1967, now abandoned. This application Aug. 26, 1968, Ser. No. 766,660
Int. Cl. F16c 11/00
U.S. Cl. 287—100 4 Claims



A pivot pin structure that includes a pivot pin having a central journal portion and opposite and integral tapered ends; split sleeves having internal frustoconical-shaped surfaces that engage the tapered ends; and a pair of plates threadedly attached to opposite ends of the pin and bearing against the ends of the sleeves for moving the sleeves axially inwardly relative to the tapered ends of the pin.

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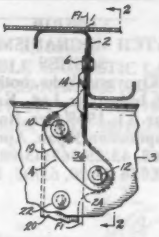
3,600,016

## FRAME STRINGER TIE

Donald R. Dilley, Seattle, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Mar. 23, 1970, Ser. No. 21,642
Int. Cl. F16b 1/00
U.S. Cl. 287—189.35 9 Claims

An aircraft axial force tie member for load transfer between first and second major structural elements; for example, between fuselage frame and skin stringer members acted upon by internal pressurization loadings. The tie member is economically constructed of lightweight flat sheet stock to provide a balanced load path having a high resistance to structural fatigue by virtue of a member shaping concept characterized by the use of a flat pattern having bend or mold lines which are curved, in contradistinction to the straight mold lines of conventional ties. The curved mold lines as disclosed will cause a wiping action during forming to thereby generate member flanges which extend in a balanced



fashion on either side of the centerline of the axial force carried by the member. Embodiments suitable for forming from titanium sheet are shown for use with zee-section and with hat-section stringers.

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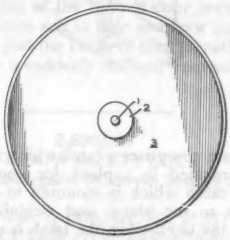
3,600,017

## HERMETIC METAL-TO-GLASS SEALS

Jeremy D. Scherer, South Dartmouth, Mass., assignor to Isotronics, Inc., New Bedford, Mass.

Continuation-in-part of application Ser. No. 612,590, Jan. 30, 1967, now abandoned. This application Feb. 26, 1968, Ser. No. 708,100
Int. Cl. F16b 11/00
U.S. Cl. 287—189.365 11 Claims



A hermetic metal-to-glass seal with a steel aperture-containing member clad with a ductile, corrosion-resistant metal and at least one corrosion-resistant terminal sealed in said aperture by said glass and electrical devices employing such seals.

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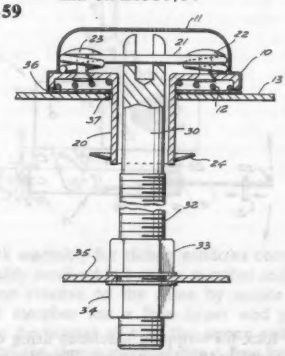
3,600,018

## AUTOMOBILE HOOD LATCH

Theodore Dzus, and Peter Schenk, both of West Islip, N.Y., assignors to Dzus Fastener Co., Inc., West Islip, N.Y.

Filed Sept. 17, 1969, Ser. No. 858,744
Int. Cl. E05c 3/04
U.S. Cl. 292—59 6 Claims



An automobile hood latch is described which includes a stud shank supported beneath the hood and provided with a

cam slot. A housing, a resilient pin supported by the housing, and a spring are carried by the automobile hood. The hood is secured by rotatively coupling the pin in the cam slot.

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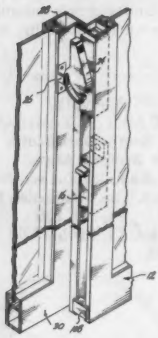
**3,600,019**
**LOCKABLE LATCH MECHANISM FOR SLIDABLE SASHES**
**Takao Toyota, and Kiyoyasu Wake, both of Tokyo, Japan, assignors to Fujisash Industries, Ltd., Kawasaki, Japan**
**Filed Apr. 11, 1969, Ser. No. 815,417**
**Claims priority, application Japan, Apr. 17, 1968, Dec. 20, 1968, 43/25,267;43/98,083**
**Int. Cl. E05b** *47/00, 65/08;* **E05c** *3/14*
**U.S. Cl. 292—106** **13 Claims**



The mechanism comprises a latch which is mounted to be manually reciprocated in a plane for engagement with a keeper, and a catch which is mounted to reciprocate in a path transverse to the plane, and yieldably biased to interengage with the latch when the latch is engaged with the keeper. It also comprises a catch release member which is mounted to reciprocate in a rectilinear path parallel to the plane, and rotatably mounted means which are operative to retract the catch from the latch, against the bias thereon, in response to reciprocation of the catch release member in one direction thereof.

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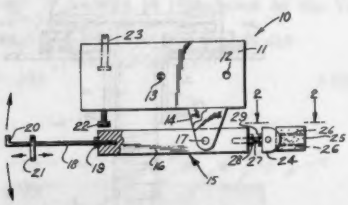
**3,600,020**
**SAFETY LOCK FOR FURNITURE-STRIPPING MACHINE**
**Andrew E. Shutt, 305 S. Oak St., Normal, Ill.**
**Filed Aug. 7, 1970, Ser. No. 62,113**
**Int. Cl. E05b** *43/00;* **E05c** *19/12*
**U.S. Cl. 292—131** **3 Claims**



A safety lock for stripping machines using chemicals having a flash point in the danger zone. This device consists of a balanced mechanism holding the door closed until the furniture to be stripped has had time to dry out, the device including a balancing weight upon the threaded rod supported within a balance bar pivotally carried by a casting secured to the machine, the other end of the balancing device having a sponge which when saturated during the spraying will allow the door to remain closed until the drying process is completed.

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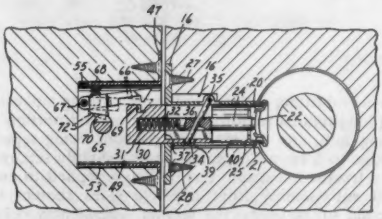
**3,600,021**
**LOCK STRUCTURE**
**Paul Maddison Hawkins, Afton, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.**
**Filed Sept. 15, 1969, Ser. No. 858,048**
**Int. Cl. E05b** *15/02, 63/20;* **E05c** *1/12*
**U.S. Cl. 292—167** **7 Claims**



An improved latchbolt structure for a self-releasing and projecting lock structure and lock means in the strike for securing the latchbolt in projected position.

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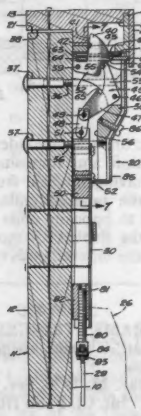
**3,600,022**
**EXIT DEVICE VERTICAL ROD UPPER LATCHING AND HOLDDOWN MECHANISM**
**Richard L. Armstrong, Santa Fe Springs, Calif., assignor to Norris Industries, Inc., Los Angeles, Calif.**
**Filed Aug. 22, 1968, Ser. No. 754,614**
**Int. Cl. E05c** *9/18*
**U.S. Cl. 292—237** **7 Claims**



An exit device consisting of a crossbar adapted to be pushed to raise upper and lower vertical actuating rods which in turn release respective upper and lower latchbolts so that the door can be opened. The upper latchbolt is pivoted near its outside end so that when released, it will fall into a

withdrawn position by gravity, assisted by a wiping of a front face of the latchbolt by a retaining plate on the doorframe. A blocker, pivoted on the inner side of the housing, holds the latchbolt in extended locked position by engagement with a downwardly facing shoulder on the inner side of the latchbolt. The upper actuating rod is linked to the blocker in such fashion that the blocker is swung out of blocking position when the actuating rod is lifted. When the actuating rod is released, the weight of the rod serves to urge the blocker toward blocking position. The upper latchbolt is returned from retracted position to extended position by a slide which is shifted transversely toward the latchbolt when the slide strikes a strike face, the slide then serving to push upon a projection on the upper latchbolt which tilts the latchbolt into the extended position, where it is blocked by the blocker until released. A lower latchbolt is also pulled to released position by upward movement of the lower actuating rod and held in released position as long as the upper latchbolt is held in released position. Also, the lower latchbolt is held in latched position as long as the upper latchbolt is held in latched position by the blocker.

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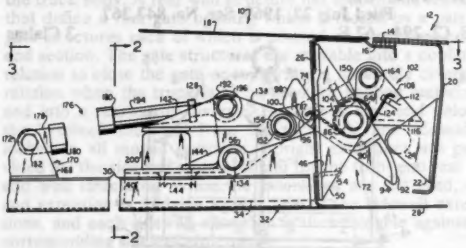
**3,600,023**
**LOCKING SYSTEM**
**Robert L. Gudde, Santee, Calif., assignor to Rohr Corporation, Chula Vista, Calif.**
**Filed Feb. 9, 1970, Ser. No. 9,543**
**Int. Cl. E05c *3/22***
**U.S. Cl. 292—201** **8 Claims**



A rotatable drive crank is connected to an actuator and to a link which in turn is connected to a rotatable latch, the latter holding a movable member in a stowed position when the actuator moves the drive crank to a first position and permitting said movable member to move away from said stowed position when said actuator moves the drive crank to a second position. A rotatable retaining lever is coaxial with the latch and one end thereof is biased into engagement with rollers mounted on the drive crank and locks the latter in said second position thereof until the other end of the lever is contacted by the movable member as it returns to its stowed position.

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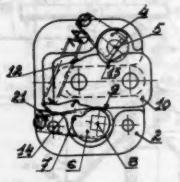
**3,600,024**
**DOOR LOCK**
**Paul Boyriven, Paris, France, assignor to Compagnie Industrielle de Mecanismes, Courbevoie, France**
**Filed Jan. 14, 1969, Ser. No. 790,912**
**Claims priority, application France, Apr. 1, 1968, 146,650**
**Int. Cl. E05c *3/22***
**U.S. Cl. 292—226** **5 Claims**



A door lock having a self-cocking mechanism in which the catching of the bolt in the locked position is obtained by the previous rocking of the bolt combined with the simultaneous rocking, but in a reverse direction, of a tightening element interacting together by a common spring whose tension increases proportionally with the closing of the door.

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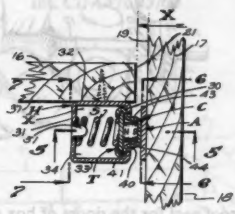
**3,600,025**
**RELEASABLE MAGNETIC LATCH**
**Maurice W. Brainard, 9339 Newcomb Ave., Whittier, Calif.**
**Filed Jan. 27, 1969, Ser. No. 794,316**
**Int. Cl. E05c *19/16*; H01f *7/04***
**U.S. Cl. 292—251.5** **10 Claims**



A magnetic latch especially suitable for cabinet doors and the like having spring means to be biased upon manual engagement and urging of the cabinet door inwardly from its normal closed position and to urge and door outwardly to an open position and past the range of the magnetic latching effect when the door is suddenly released from said manual engagement.

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**3,600,026**
**WINDOW SAFETY LOCK**
**Carl T. Savio, and Margaret M. Savio, both of 2000 Creston Ave., Bronx, N.Y.**
**Filed Apr. 3, 1970, Ser. No. 25,511**
**Int. Cl. E05c *17/30*; E05b *65/08***
**U.S. Cl. 292—276** **5 Claims**

An upright lock assembly for sliding windows comprises a rod member slidably received in a sleeve member and held in adjustable relation relative to the same by means of setscrews. The rod member has a free upper end pivotally mounted about a horizontal axis to the upper sash of an upper window and the sleeve member has a free lower end removably accommodated in a socket mounted to the upper sash of a lower window. A padlock serves to further secure the lower end of the sleeve in the socket member.

3,600,027
**TAMPER PROOF SEAL**
William P. Noland, 402 Helke Road, Vandalia, Ohio, and Glenn W. Layman, 1030 Bookwalter Drive, New Carlisle, Ohio
Filed Nov. 27, 1968, Ser. No. 779,527
Int. Cl. B65d *55/06, 63/10*
U.S. Cl. 292—322 7 Claims

A tamper proof seal for the doors of box cars or like applications comprised of a single elongate plastic strip the ends of which interlock.

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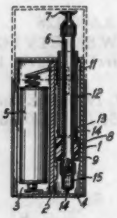
3,600,028
**DEVICE FOR INSERTING AND REMOVING CONTACT LENSES**
Wilhelm Henning, 64 Heggerstrasse, 432 Hattingen, Germany
Filed Mar. 12, 1970, Ser. No. 19,036
Claims priority, application Germany, Mar. 12, 1969, P 19 12 421.1
Int. Cl. G02c *11/00*
U.S. Cl. 294—1 CA 6 Claims



An apparatus for inserting and removing contact lenses, which includes a suction head for a contact lens which is mounted at one end of a tube and permits the eye to view through the lens supporting member, and which also includes focusing light means adapted to be viewed through said tubular means, said tubular means being displaceable in a sleeve while the apparatus is equipped with a closing contact which in response to a pull out of the tubular means automatically turns on a fixation light, whereas when moving the tube inwardly the light is extinguished, said apparatus being equipped with suction creating means operable in response to a slight movement of the supporting means in the direction toward the sleeve means and becoming effective when the contact lens engages the supporting means so that said lens will be firmly drawn to and held by said lens supporting means.

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3,600,029
**PECAN RETRIEVER**
Rudolph Nagel, 1305 Ainsworth St., Gonzales, Tex.
Filed Sept. 25, 1969, Ser. No. 860,926
Int. Cl. A01d *11/02*
U.S. Cl. 294—19 A 4 Claims

This specification discloses a device intended to be used in retrieving pecans from the ground with a pickup action. The device comprises an elongate rod having an out-turned handle at its upper free end and a retrieving receptacle detachably secured to its lower end. The lower end of the rod is formed with two recesses spaced 180° apart and the receptacle carries a spring latch which cooperates with one of these recesses to mount the receptacle on the rod in either one of two diametrically opposed positions to adapt the device for use by either a right-handed or a left-handed person.

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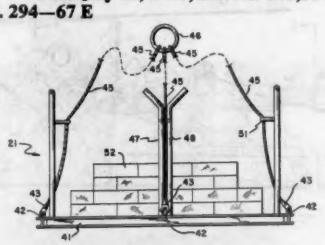
3,600,030
**MATERIALS HANDLING DEVICE WITH GUIDES**
Joseph Varon, Savannah, Ga., assignor to Shell Oil Company, New York, N.Y.
Filed July 22, 1969, Ser. No. 843,367
U.S. Cl. 294—67 E 3 Claims



A device for the transport of materials from one location to another including a platform for supporting said materials, padeyes positioned on said platform, shackles secured to said padeyes and connected to lift lines and guide means secured to said platform and adapted to maintain said shackles and said lines out of contact with said transported materials.

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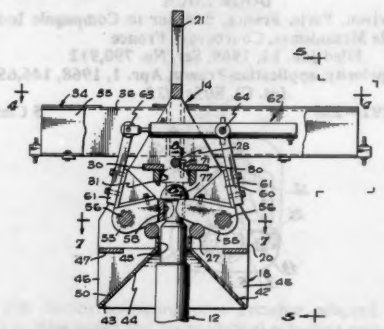
3,600,031
**HOISTING COUPLER**
Fred K. Coleman, Los Alamitos, and Robert B. Schmid, South Gate, both of, Calif., assignors to Ameron, Inc., Monterey Park, Calif.
Filed Dec. 23, 1968, Ser. No. 786,156
Int. Cl. B66c *1/66*
U.S. Cl. 294—88 5 Claims



The application discloses a coupling device adapted to be suspended from a hoisting line for coupling to an object to be

lifted having an upright headed pin. The device receives the pin and has fluid-powered jaws for grasping the pin together with safety means to prevent premature opening or closing of the jaws including a valve means operable by the pin.

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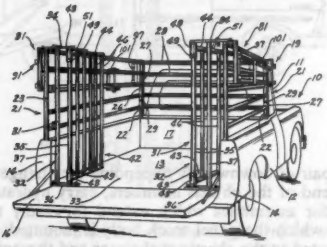
**3,600,032**
**LIVESTOCK RACK FOR A VEHICLE BODY**
**Roland C. Gross, 118 S.E. Jackson, Greenfield, Iowa**
**Filed Nov. 6, 1969, Ser. No. 874,481**
**Int. Cl. B60p *3/04***
**U.S. Cl. 296—13** **1 Claim**



The livestock rack is intended for use with a pickup truck and includes sidewall structures secured to the side panels of the truck body. A rear wall structure has spaced end sections that define a rear gate opening which is closed by a pair of gate structures each of which is pivoted on a corresponding end section. The gate structures are movable into a coplanar relation to close the gate opening; into a forwardly diverged relation when the truck is to be used for hauling materials, and into a rearwardly diverged relation to load and unload the livestock into and from the rack, and are releasably locked in all moved positions. Upright extensions are provided for the sidewall structures and for the front and rear or end wall structures. When the extensions are not used, an end extension is foldable against one of the sidewall extensions, and each sidewall extension is then foldable against a corresponding sidewall structure.

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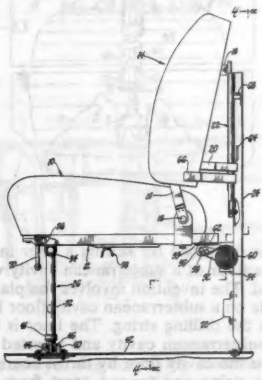
**3,600,033**
**FOLD-UP SEAT**
**Carl J. Holdampf, Southfield, and Randal T. Murphy, Royal Oak, both of, Mich., assignors to Lear Siegler, Inc., Santa Monica, Calif.**
**Filed Nov. 5, 1969, Ser. No. 874,323**
**Int. Cl. A47c *4/00***
**U.S. Cl. 297—16** **9 Claims**



A collapsible unison acting spring suspended seat comprising a seat having a pivotal front leg assembly, a spring biased arm resiliently supporting the back of the seat when in the occupiable condition, a backrest pivotally connected to the rear of the seat and a vertical track for permitting the backrest to displace vertically in unison with the rear of the seat. The backrest may be latched in a raised position which permits the seat to pivot into a collapsed position wherein it hangs beneath the backrest and between the backrest and the floor.

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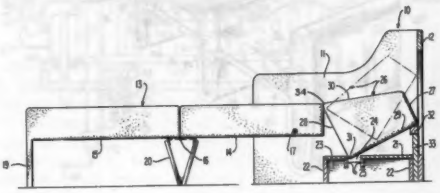
**3,600,034**
**CONVERTIBLE FURNITURE**
**Melvin R. Jones, Baltimore; Victor M. Peruzzi, Forestville, and Joseph G. Peruzzi, Forestville, all of, Md., assignors to Victor Stanley, Inc., Dunkirk, Md.**
**Filed July 30, 1969, Ser. No. 846,190**
**Int. Cl. A47c *13/00***
**U.S. Cl. 297—105** **4 Claims**



A readily convertible chair and bed structure which is characterized by extreme simplicity of construction and operation. A simple folding mode enables quick conversion from chair to bed or lounge. A unique head bolster is positively positioned for sleep at a desirable angle by an underlying support contained in the chair frame.

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**3,600,035**
**AUTONOMOUS SEAT FOR CHAIR**
**Georges Vondrejs, 953 Cherrier Street, Montreal 132, Quebec, Canada**
**Filed Sept. 8, 1969, Ser. No. 855,882**
**Claims priority, application Canada, Sept. 20, 1968, 305,55**
**Int. Cl. A47c *7/02***
**U.S. Cl. 297—230** **2 Claims**

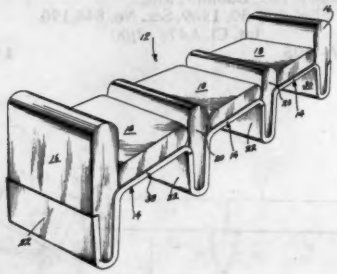
Seats intended for use on sundry supports. They are formed with a rigid frame having a back portion and a seat portion. The frame defines a continuous closed outline having two lateral sides and two transversal sides and these sides are spread by a constant and predetermined distance. A removable bar is transversely fixed to the two lateral sides of the frame at the junction between the frame and maintaining said predetermined distance constant. Finally, the seats having covering means solid over the frame and means for securing the covering means over the frame, the covering means forming a rigid and nonextensible stretched body to receive the weight of a person.

3,600,036

## COMPONENT SEATING

Farid A. Iskander, Brooklyn, N.Y., assignor to Herman Miller, Inc., Zeeland, Mich.

Filed July 9, 1969, Ser. No. 840,166
Int. Cl. A47c *3/04, 1/08, 7/54*
U.S. Cl. 297—239 12 Claims



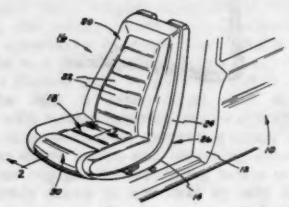
This disclosure relates to a seating construction in which base units can be interlocked in tandem arrangement for benches and the like. Cushion receiving pockets are formed between base units and cushions are positioned in the pockets as well as on seat portions of the base units. The base units are formed with U-shaped leg members on either side to facilitate the interlocking relationship and to permit vertical stacking of the units in nested position with the cushions between the nested base members.

3,600,037

## VEHICLE SEAT WITH INDIVIDUALLY PIVOTAL BOLSTER SECTION

Thomas E. Lohr, Warren, Mich., assignor to Allied Chemical Corporation, New York, N.Y.

Filed June 5, 1969, Ser. No. 830,736
Int. Cl. A47c *7/50;* B60n *1/06*
U.S. Cl. 297—312 8 Claims



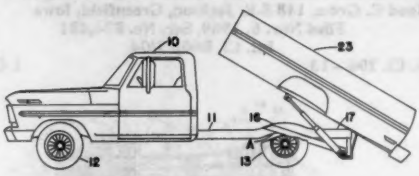
A vehicle seat having a seat portion and a back rest portion and an independently adjustable bolster pivotally supported in the front section of the seat portion.

3,600,038

## DUMPING ATTACHMENT FOR PANEL TRUCKS

Marcus J. Jones, and William Michaluk, both of Winnipeg, Manitoba, Canada, assignors to C. & S. Jones Limited, Winnipeg, Manitoba, Canada

Filed Oct. 24, 1969, Ser. No. 869,134
Int. Cl. B60p *1/16*
U.S. Cl. 298—22 P 1 Claim



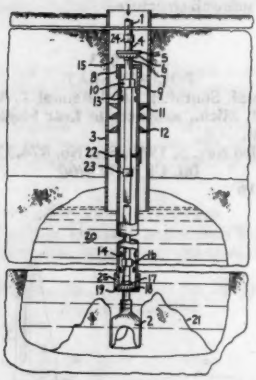
A pair of downwardly depending rear hangers one at each rear end of the chassis members, carry hydraulic piston and cylinder assemblies which extend forwardly to a subframe upon which the panel truck body is mounted. The subframe is pivoted to the chassis at the rear end thereof and lies flush with the chassis when down because the longitudinal members of the subframe lie on the outside of the two chassis longitudinal members.

3,600,039

## METHOD OF MINING SUBTERRANEAN RUBBLE PILES

Selby W. Porter, Calgary, Alberta, Canada, assignor to Kalium Chemicals Limited, Regina, Saskatchewan, Canada

Continuation-in-part of application Ser. No. 790,581, Jan. 13, 1969, now abandoned. This application June 25, 1970, Ser. No. 49,894
Int. Cl. E21b *43/28*
U.S. Cl. 299—5 8 Claims

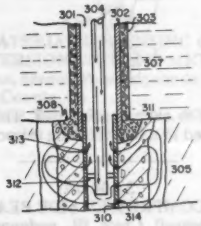


A method is described for setting a liner in a rubble pile located on the floor of a subterranean cavity which is being solution mined. The invention involves the placing of a liner in a rubble pile on a subterranean cavity floor by introducing the liner with the drilling string. The liner is carried to the bottom of a subterranean cavity and inserted in the rubble pile located on the cavity floor by thrust bearings positioned on the tubing string and spaced apart from each other a distance greater than the distance encountered by the liner associated with the drilling string. Provision is made for insertion of the liner into the rubble pile once the drill has entered the pile a desired distance and means are provided for cutting the drill bit from the assembly. Specific provisions are made in the liner assembly for the introduction of fluid to the rubble pile and the removal of fluid therefrom.

## 3,600,040
## ROOF BOLTING AND COLUMN BUILDING FOR SOLUTION MINING

Donald W. Dareing, Fayetteville, Ark., assignor to Cities Service Oil Company

Filed Oct. 16, 1969, Ser. No. 866,873
Int. Cl. E21b 43/28
U.S. Cl. 299—5 10 Claims

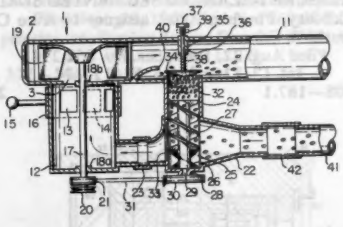



A well is drilled down to the mineral deposit to be mined. The mineral deposit is penetrated by the drill bit so that about 10 percent of the total thickness of the mineral deposit is exposed to the wellbore. A given volume, the size of a required cap for the roof bolt, is washed out about the wellbore and hanging wall of the mineral deposit. The cap and bolt are formed by introducing casing and cementing it and the washed out area to the roof of the soluble material. After the bolt has been set, the cap is drilled through and solution mining progressed. The mineral is washed away from the cement cap leaving a capped roof bolt to inhibit roof slouching. Columns may be formed by washing a cylindrical area to the foot wall by progressive lowering of the washing tube into the mineral deposit and sealing a perforated liner to the footwall. A permeable cement or an impermeable cement which is subsequently perforated may be used as the sealant so that fluid may flow freely from the wellbore to the mineral deposit. The mineral is then washed by introduction of washing fluid through the perforated liner and permeable column into the mineral formation.

## 3,600,041
## SUCTION CONVEYER

Shuichi Hirano, 19, Kamiichimachi Mikkachi, Nakaniikawa-gun, Toyama-ken, and Seiichi Noda, 2-54, Nanazukamachi, Kizu, Kahoku-gun, Ishikawa-ken, both of, Japan

Filed Nov. 5, 1968, Ser. No. 773,604
Int. Cl. B65g 53/04
U.S. Cl. 302—23 5 Claims

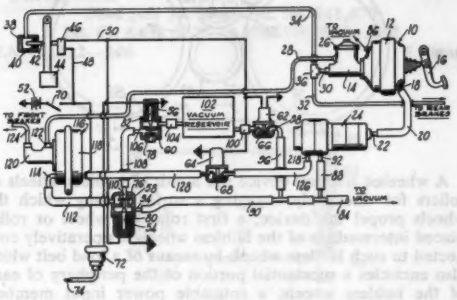



A suction conveyor for conveying material such as rice, wheat, barley, beans and maize. The suction conveyor of the invention comprises a conveying mechanism having a suction fan by suction air and particular mechanical separating means for separating air from the conveying material disposed in a suction passage at a preceding position before the suction fan. The material separated from the suction air by the mechanical separating means is discharged from the suction conveyor by means of air blowing.

## 3,600,042
## BRAKE SYSTEM CONTROL MEANS

Maxwell L. Cripe, South Bend, Ind., assignor to The Bendix Corporation

Filed Dec. 27, 1968, Ser. No. 828,796
Int. Cl. B60t 8/14, 13/60
U.S. Cl. 303—21 F 4 Claims

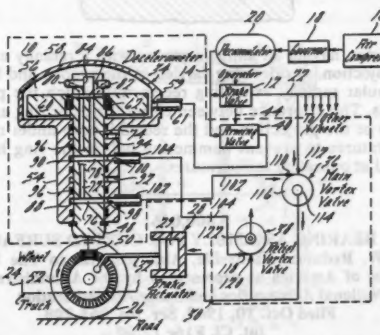



A relay control valve operatable by a control pressure to monitor a slave servomotor which valve has additive pressure responsive elements adapted to be effective at progressively different values of the control pressure whereby the ratio of the control pressure for the valve with respect to a control pressure from the valve to the slave servomotor is variable. In addition, the valve can be linked with an antiskid control system to maximize effectiveness of the slave servomotor on at least a portion of a vehicle's brake system in which incorporated.

## 3,600,043
## ANTISKID BRAKE SYSTEM UTILIZING A PAIR OF VORTEX VALVES

John T. Kasselmann, Southfield, Mich., assignor to The Bendix Corporation

Filed July 7, 1969, Ser. No. 839,467
Int. Cl. B60t 8/12, 13/36
U.S. Cl. 303—21 F 17 Claims



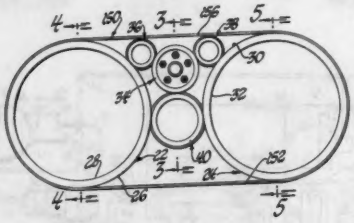

An antiskid brake system particularly suited for use with existing pneumatic brake systems having a wheel decelerometer to detect above normal wheel deceleration rates in combination with a pair of vortex valves, a first vortex valve for restricting the flow of air to the brake and a second vortex valve for relieving air pressure at the brake when above normal wheel decelerations occur.

**3,600,044**

## ADAPTIVE WHEELED TRACTION DEVICE

Walton W. Cushman, Fraser, Mich., assignor to Martin Tucker, trustee, New York, N.Y.

Filed July 7, 1969, Ser. No. 846,626
Int. Cl. B62d 55/12
U.S. Cl. 305—20 19 Claims



A wheeled traction device has a pair of hubless wheels or rollers for effectively engaging a surface along which the wheels propel the device; a first rotatable wheel or roller placed intermediate of the hubless wheels is operatively connected to such hubless wheels by means of a load belt which also encircles a substantial portion of the periphery of each of the hubless wheels; a rotatable power input member, adapted for connection to a power output shaft of an associated vehicle, is also operatively connected to said belt means and the first intermediate wheel or roller; the first intermediate wheel or roller functions to reverse the effective direction of rotation of the power input member when it is rotated by said vehicle power output shaft thereby causing the hubless wheels to rotate in the same direction as the power input member.

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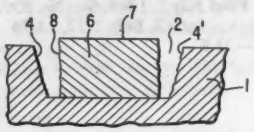
**3,600,045**

## PISTON AND RIDER RING COMBINATION FOR HORIZONTAL RECIPROCATING COMPRESSORS

Kazuo Inoue, Tokyo, Japan, assignor to Nippon Piston Ring Co. Ltd., Chiyoda-ku, Tokyo, Japan

Filed Aug. 19, 1968, Ser. No. 753,347
Claims priority, application Japan, Aug. 24, 1967, 42/72203
Int. Cl. F16c 29/00, 17/00
U.S. Cl. 308—4 3 Claims



A piston having an annular groove with a radially extending projection. A rider ring carried in the groove and having an annular radially extending recess into which the projection fits. The clearance between either the rider ring and the groove or the projection and the recess is zero under normal temperatures to prevent hammering before the ring has expanded at operating temperatures.

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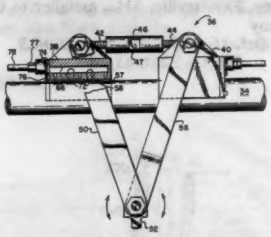
**3,600,046**

## AIR BEARING ASSEMBLY FOR CURVED SURFACES

John W. Redmon, Huntsville, Ala., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration

Filed Oct. 10, 1969, Ser. No. 865,298
Int. Cl. F16c 17/00
U.S. Cl. 308—5 4 Claims

The invention is a journal type air bearing wherein a cylindrical bearing member or cup is designed to ride or float on a shaft. The bearing is split into two parts or halves that each have a round groove cut therein that conforms to the shape of the shaft and are connected by an adjustment mechanism that maintains a particular spacing between the two bearing halves. Each bearing half has an air manifold connected to a source of pressurized air so that an air film or gap can be maintained between the surface of the round groove in the bearing half and the surface of the shaft. Two pairs of elongated links are pivotally connected at one of their ends to the



bearing, one pair to each bearing half. The other end of the links are connected to a load bearing support member.

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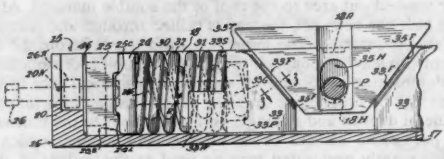
**3,600,047**

## PRECOMPRESSED SIDE BEARING

Robert W. MacDonnell, Crete, Ill., assignor to Unity Railway Supply Co., Inc.

Continuation-in-part of application Ser. No. 760,019, Sept. 16, 1968, and a continuation-in-part of 676,259, Oct. 18, 1967, now Patent No. 3,401,991, dated Sept. 17, 1968. This application Mar. 11, 1970, Ser. No. 18,604
Int. Cl. F16c 25/04
U.S. Cl. 308—138 17 Claims



Side bearing units are provided with a precompression arrangement that limits upward expansion so that contact of the side bearing with the car body is precluded during level ride conditions and during high roll conditions. A rugged retainer pin projects through a floating upper wedge and through the main housing to limit upward travel of the wedge. Compression springs acting on sliding wedge blocks that engage the floating wedge are held compressed by the retainer pin.

The wedge blocks have serrations to define accurately wear teeth on their top faces to indicate the amount of wear and the size of shim required to compensate for wear.

A high energy compression spring nest requiring minimum travel is utilized to achieve a compact unit.

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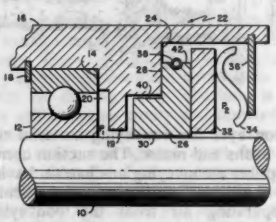
**3,600,048**

## PRESSURE BALANCED SEGMENTED SEAL

Mark Makhobey, Phoenix, Ariz., assignor to Avco Corporation, Stratford, Conn.

Filed Aug. 22, 1969, Ser. No. 852,294
Int. Cl. F16c 33/26; F16j 15/34
U.S. Cl. 308—187.1 2 Claims



The disclosure shows a seal assembly for use with a rotating shaft. A fixed radially extending annular sealing face is

positioned around the shaft. A segmented radial-type seal element also surrounds the shaft and has an outer radial face which is urged against the fixed annular face by a suitable spring. A garter spring surrounds the seal element to urge the inner surface of the seal element in sealing engagement with the rotatable shaft. The outer radial face is at the axial midpoint of the seal element so that the resultant radial pressure forces on the periphery and the inner sides of the seal element are substantially constant irrespective of variations in the external pressure differential across the seal.

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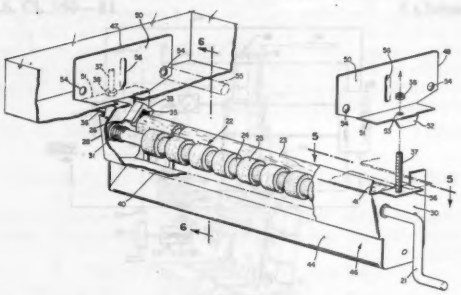
**3,600,049**
**SHEET MATERIAL DISPENSING CABINET, CONVERSION UNIT AND METHOD**

**Lehyman J. Bastian, Media, Pa., assignor to Scott Paper Company, Delaware County, Pa.**

**Filed Nov. 20, 1969, Ser. No. 878,359**
**Int. Cl. B65h *19/00***
**U.S. Cl. 312—37** **18 Claims**



A method and apparatus for converting a cabinet normally adapted to dispense sheet material from a stack of folded sheet material into a cabinet capable of dispensing sheet material from a roll of wound sheet material, involving the attachment of feed means beneath an elongate dispensing opening in the bottom wall of the cabinet through the use of fastener means operating through spaced-apart portions of the dispensing opening, the opposite ends of the fastener means serving to hold guide plates disposed inside of the cabinet in an upright position so as to control the position of the roll from which the sheet material is being unwound.

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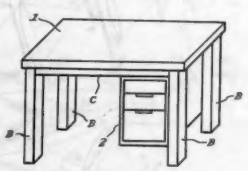
**3,600,050**
**DIVISIBLE LEG TYPE DESK**

**Kokichi Kunishima, Osaka, Japan, assignor to Kabushikikaisha Ithoki Kosakusho, Osaka, Japan**

**Filed Sept. 23, 1969, Ser. No. 860,305**
**Claims priority, application Japan, Dec. 26, 1968, 43/114180**
**Int. Cl. A47b *17/00***
**U.S. Cl. 312—194** **9 Claims**



Each leg of a desk includes a long rodlike pipe made of iron sheet to the upper end of which a crossing member is welded at its front portion. The leg is screwed at a rear portion of said crossing member to each corner of a frame mounted on the back of a top board of the desk. A stack drawer on one side of the desk or stack drawers on two sides are mounted on the desk between the frame and the leg.

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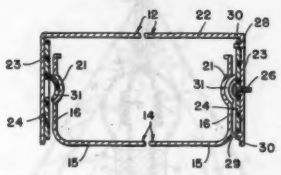
**3,600,051**
**ASH RECEPTACLE FOR AUTOMOBILES**

**Henry De Boer, Lowell, Mich., assignor to F. L. Jacobs, Inc., Detroit, Mich.**

**Filed July 14, 1969, Ser. No. 841,470**
**Int. Cl. A47b *67/02*; A47f *5/08*; B60n *3/08***
**U.S. Cl. 312—246** **5 Claims**



The receptacle structure comprises a fixed, sheet metal stamped mounting member of inverted channel-shaped rectangular section, whose depending flanges are flat substantially throughout. Each flange has a rigid rectangular and nonmetallic frictional guide plate, for example of a thermosetting plastic, fixedly applied to its inner surface, as by a single screw and coacting flange tabs, the plates also being generally flat in character. Each guide plate has a pair of horizontally aligned, integral and inwardly molded, flexible guide lug or skid formations of quasicircular outline, which formations mate under sliding friction in longitudinal grooves of the ash box or receptacle member of the structure.

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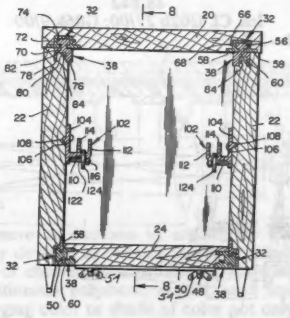
**3,600,052**
**KNOCKDOWN ARTICLE OF FURNITURE AND FITTINGS THEREFOR**

**Jack M. Marateck, 785 Mace Ave., Bronx, N.Y.**

**Filed Sept. 19, 1969, Ser. No. 859,335**
**Int. Cl. A47b *47/00***
**U.S. Cl. 312—263** **16 Claims**



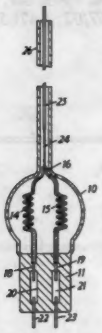
A knockdown article of furniture formed of a plurality of panels. A number of the panels are interengaged by slidably interengaging male and female extruded fittings secured on edges and surfaces of the panels. A further panel is slidable in grooves formed in the slidably interengaged panels and is secured to one of the number of slidably interengaged panels, to lock all of the panels into unitary structure.

3,600,053

## SINGLE-ENDED FILAMENT LAMPS

Victor Mark Smith, London, England, assignor to Thorn Lighting Limited, London, England

Filed Dec. 29, 1969, Ser. No. 888,719
Claims priority, application Great Britain, Feb. 13, 1969, 7959/69
Int. Cl. H01J 9/18
U.S. Cl. 316—19 1 Claim



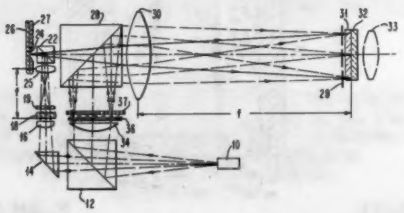
A single-ended tungsten halogen lamp having an envelope, a press seal closing one end of the envelope, two filament sections each having one end separately supported in said press seal, a common electrically conductive support for the other ends of said filament sections, and a tip in the wall of said envelope, said common support being embedded in said tip and said filament sections being secured in electrically conductive relation to said support. During manufacture the filament assembly is supported by a fine wire attached to the support and extending through the exhaust tube. On closure of the exhaust tube the tip is formed around the support and the fine wire is burnt through.

3,600,054

## HOLOGRAPHIC ASSOCIATIVE MEMORY PERMITTING CONVERSION OF A PATTERN TO A MACHINE-READABLE FORM

Dennis Gabor, London, England, assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation of application Ser. No. 565,519, July 15, 1966, now abandoned. This application June 11, 1970, Ser. No. 48,842
Int. Cl. G02b 27/00; G06k 9/00
U.S. Cl. 350—3.5 7 Claims



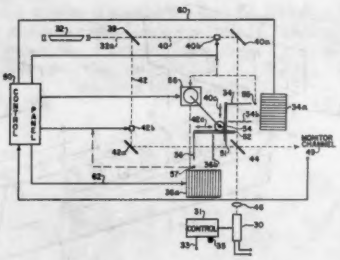
A holographic device for producing output image patterns in response to different input pattern wave fronts is described. A novel hologram is formed by the interference of a first pattern of electromagnetic waves and a second pattern of electromagnetic waves. The resultant hologram may be irradiated with a pattern of electromagnetic waves corresponding to the first pattern to reconstruct the second pattern of electromagnetic waves, and vice versa. To form the hologram a coherent light beam, such as from a laser, is directed on an object such as a transparency having a pattern thereon. The light from the object is directed onto a photographic emulsion. A coherent light beam also illuminates a second pattern, such as a coded apertured plate, and the light passing through the apertures is directed onto the photographic emulsion where it forms an interference pattern with the light from the first pattern. A hologram is thereby formed which, when illuminated by a pattern similar to one of the original patterns will reconstruct an image of the other original pattern.

3,600,055

## HOLOGRAPHIC FLIGHT SIMULATOR

Robert M. Emerick, El Segundo, Calif., and James A. Horton, Munroe Falls, Ohio, assignors to Goodyear Aerospace Corporation, Akron, Ohio

Filed Nov. 17, 1969, Ser. No. 877,315
Int. Cl. G02b 27/00
U.S. Cl. 350—3.5 3 Claims



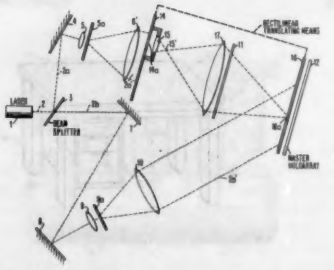
The invention provides real time simulation techniques based on the use of holographic data storage. It possesses all of the advantages of a three-dimensional model optical pickup simulator and almost none of the disadvantages. The use of holograms eliminate the need for large models and associated structures. Coherent light and a plurality of channels, each channel controllable, and each channel adapted to receive separate holograms arranged in appropriate sequence to give simulation of motion in any of $6^6$ of movement comprise the structural embodiment.

3,600,056

## RECORDING AND REPLICATION OF ARRAYS OF HOLOGRAMS

John H. King, Jr., Endwell, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 24, 1969, Ser. No. 879,481
Int. Cl. G02b 27/00
U.S. Cl. 350—3.5 1 Claim



High fidelity holograms can be replicated in quantity from a master hologram constructed by side band techniques in

which spatial filters are employed in both reference and object beams. A collimating lens provides a plane wave reference beam which interferes with a convergent object beam produced by a focusing lens at an image plane occupied by the master hologram, the object function being located either before or after the focusing lens. In the replication process, the master hologram containing a plurality of discrete holograms and the hologram plate on which replicas of the master are to be recorded are placed one on either side of the focusing lens and separated from the latter by equal distances. A reference beam is directed through the master, which yields a diffracted beam constituting the master image that passes through the focusing lens and interferes with a component reference beam to form interference patterns, characterized as different from those on the master holoarray, on the emulsion side of the plate, which when developed forms the replicated hologram.

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**3,600,057**

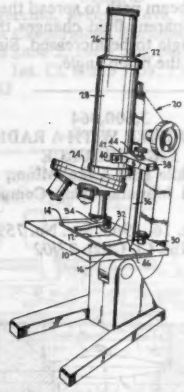
**SINGLE SLIDE MICROSCOPY APPARATUS**

**Raymond J. Leffler, Rte. 1, Rockford, Tenn.**

**Filed Apr. 17, 1969, Ser. No. 817,108**

**Int. Cl. G02b** *7/00, 21/34*

**U.S. Cl. 350—81** **4 Claims**



A process of microscopy and apparatus therefor wherein a slide divided into a specimen area and a reference area is positioned on a microscope stage for visual selection of object points within the specimen area, reference marks are applied to such reference area by a marking device to identify each selected object point, and the reference marks are subsequently aligned adjacent an indicator device to readily relocate such object points for further examination.

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**3,600,058**

**OPTICAL FIBER DISPLAY DEVICE**

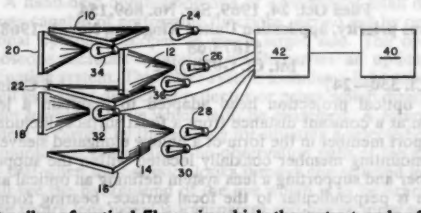
**Keisuke Kato, Tokyo-to, Japan, assignor to Research Institute of Technometrics Co., Ltd., Chiyoda-ku, Tokyo, Japan**

**Filed Sept. 5, 1969, Ser. No. 855,572**

**Claims priority, application Japan, Sept. 11, 1968, 43/64,905**

**Int. Cl. G02b** *5/16*

**U.S. Cl. 350—96 B** **1 Claim**




Bundles of optical fibers, in which the output ends of the optical fibers are arranged to form line segments, are grouped together so that the line segments, in combination, are capable of representing alpha-numeric symbols to be displayed. By selectively illuminating light sources adjacent the input end of the optical fiber bundles the display device can be used to display a variety of symbols.

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**3,600,059**

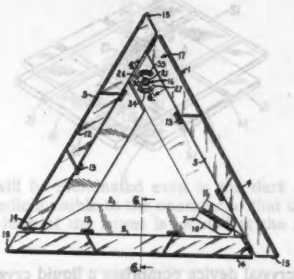
**COLLAPSIBLE, EMERGENCY TRAFFIC SIGNAL DEVICE**

**Robert V. Evans, Jackson, Mo., assignor to Rupert Manufacturing Company, Inc., Blue Springs, Mo.**

**Filed Dec. 10, 1969, Ser. No. 883,858**

**Int. Cl. G02b** *5/12*

**U.S. Cl. 350—97** **7 Claims**



A collapsible, emergency traffic signal device has a planar base leg and a pair of planar side legs forming an equilateral triangle with reflective material retained on at least one side of the triangle. One side leg is connected to one end of the base leg and the other side leg is connected to the other end of the base leg whereby the side legs are foldable over the base leg for storage. A latch is mounted on certain legs for holding the three legs in the triangular forming position.

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**3,600,060**

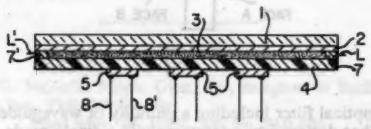
**DISPLAY DEVICE CONTAINING MINUTE DROPLETS OF CHOLESTERIC LIQUID CRYSTALS IN A SUBSTANTIALLY CONTINUOUS POLYMERIC MATRIX**

**Donald Churchill, Kettering, and James V. Cartmell, Dalton, both of, Ohio, assignors to The National Cash Register Company, Dayton, Ohio**

**Filed Feb. 23, 1968, Ser. No. 707,706**

**Int. Cl. G02f** *1/28;* **H01j** *29/10*

**U.S. Cl. 350—160** **17 Claims**




This disclosure is directed to articles of manufacture, chiefly display devices, containing minute "naked" droplets or inclusions of cholesteric liquid crystal material in a substantially continuous polymeric matrix, said liquid crystal material changing color or shade of color not only upon application of an electric potential but also upon removal of the field. The image produced has a comparable outline to that of the path of the electric field. Three chromatic states are evident, the normal color (before the electric potential is applied), the color given off when the electric field is applied, and the color observed when the electric field is removed. All three chromatic states are readily discernible from one another. The polymer matrix protects the cholesteric liquid crystal droplets from aging and enhances electric field behavior because the third chromatic state (electric potential

removed) has a greater longevity with the matrix-bound material versus unprotected material of identical composition but no polymeric matrix. Other advantages are also discussed.

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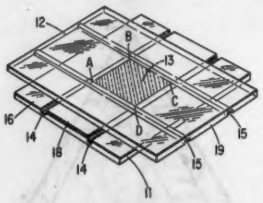
3,600,061

## ELECTRO-OPTIC DEVICE HAVING GROOVES IN THE SUPPORT PLATES TO CONFINE A LIQUID CRYSTAL BY MEANS OF SURFACE TENSION

George Harry Heilmeier, Philadelphia, Pa., and Louis A. Zanoni, Mercer, N.J., assignors to RCA Corporation

Filed Mar. 21, 1969, Ser. No. 809,131
Int. Cl. G02f 1/16
U.S. Cl. 350—160 4 Claims




A liquid crystal device comprises a liquid crystal composition sandwiched between conductive support plates wherein the liquid crystal composition is restricted to a specific area between the support plates by means of grooves in the support plates. The grooves which can be formed in many ways can be on one or both support plates and define a closed area into which the liquid is confined.

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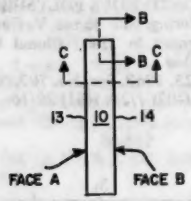
3,600,062

## WIDE ANGLE NARROW BAND OPTICAL FILTER

Eugene R. Schineller, Huntington Station, N.Y., and Donald W. Wilmot, Nashua, N.H., assignors to Hazeltine Research, Inc.

Filed Feb. 14, 1967, Ser. No. 616,034
Int. Cl. G02b 5/28
U.S. Cl. 350—166 8 Claims




An optical filter including a plurality of waveguides which are either designed to operate only in a single mode or have their transmission limited to a single mode by an external means. Semitransparent mirrors are placed within, or at the ends of each waveguide to provide interference type filtering in each waveguide. Since the propagation characteristics of each waveguide are independent of the angle of the incident wave, the filter provides narrow band transmission of an incident plane wave or image over a wide field of view.

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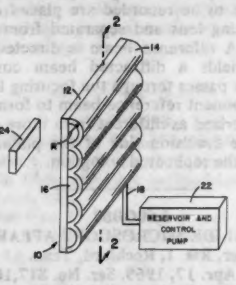
3,600,063

## VARIFOCAL BEAM SPREADER

Thomas R. Bowen, 3911 Shamrock Drive N.W., Huntsville, Ala.

Filed Apr. 28, 1969, Ser. No. 819,870
Int. Cl. G02b 27/02, 1/06, 3/12
U.S. Cl. 350—167 5 Claims

A varifocal beam spreader that permits a rapid variation in the beam divergence angle while maintaining a uniform intensity across an illuminated field. The uniform intensity feature is especially significant when used in conjunction with a laser where the Gaussian intensity distribution and the erratic local fluctuations of the laser beam result in nonuniform intensity distribution. Beam divergence can be varied to allow a maximum amount of energy to be concentrated into the area of interest very rapidly. A lenticular plate comprising a




series of elongated lenslets forms a series of parallel semicircular tubes. The tubes are filled with a transparent fluid having an index of refraction close to that of the tubes. The plate is placed in the light beam path to spread the beam. Applying pressure to the transparent fluid changes the plate surface, allowing the beam angle to be increased. Similarly, reducing the pressure, reduces the beam angle.

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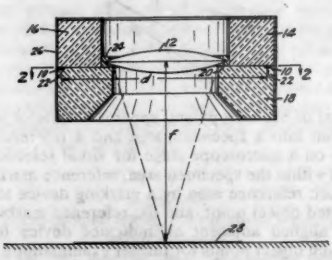
3,600,064

## PORTABLE MAGNIFIER WITH A RADIOLUMINOUS LIGHT SOURCE

Richard N. Walz, White Bear Lake, Minn., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed Sept. 16, 1968, Ser. No. 759,907
Int. Cl. G02b 27/02
U.S. Cl. 350—236 5 Claims




Self-luminous portable magnifier comprising a radioluminous light source to illuminate and a lens to magnify visually recorded data to be read. The combination provides substantially uniform illumination of the magnified portion of the matter to be read.

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3,600,065

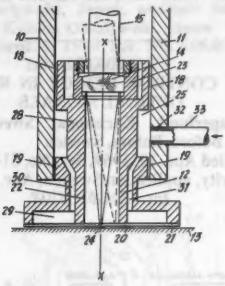
## OPTICAL PROJECTION HEAD

Stanley James Law, and Ian Hugh MacKenzie, both of Anniesland, England, assignors to Barr and Stroud Limited, Anniesland, Glasgow, Great Britain

Filed Oct. 24, 1969, Ser. No. 869,154
Claims priority, application United Kingdom, Nov. 1, 1968, 51875/68
Int. Cl. G02b 7/02
U.S. Cl. 350—247 6 Claims

An optical projection head adapted to maintain a lens system at a constant distance from a focal surface, including a support member in the form of a hollow elongated sleeve, a lens mounting member coaxially located within the support member and supporting a lens system defining an optical axis which is perpendicular to the focal surface, bearing formations spaced along the optical axis for slidably supporting the lens mounting member for movement in a direction parallel

to the axis, and the lens mounting member having an end portion projecting from the sleeve which defines a gas bearing for supporting the lens system at a predetermined distance from the focal surface.



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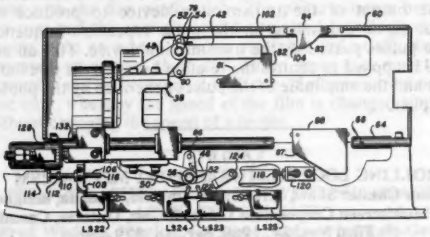
## 3,600,066
## OPTICAL ASSEMBLY WITH SUPPLEMENTAL LENS MEANS

George D. Del Vecchio, Briscoe Cove, North Rose, N.Y., assignor to Xerox Corporation, Rochester, N.Y.

Filed June 2, 1969, Ser. No. 829,605
Int. Cl. G02b 7/04, 15/02
U.S. Cl. 350—183 8 Claims



An optical assembly capable of being used in a machine for reproducing documents at one of a plurality of optical reduction rates. The optical assembly includes a first lens movable along the optical path and second and third lenses selectively movable into and out of the optical path. The first, second and third lenses are operatively coupled so that movement of the first lens along the optical path will cause the camming in of the second or third lens into the optical path at the proper positioning of the first lens to thus achieve the various optical reduction rates.

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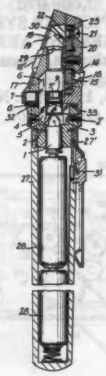
## 3,600,067
## HAND-HELD OPHTHALMOSCOPES

Helmut A. Heine, Herrsching, Upper Bavaria, Germany, assignor to Optotechnik G.m.b.H. and Propper Manufacturing Company, Inc.

Filed Oct. 8, 1969, Ser. No. 864,786
Claims priority, application Germany, Nov. 23, 1968, P 18 10 536.7
Int. Cl. A61b 3/12
U.S. Cl. 351—12 12 Claims

A hand-held ophthalmoscope of exceedingly small dimensions capable of performing functions carried out by conventional ophthalmoscopes of much larger size. The ophthalmoscope includes a housing which carries an optical illuminating system. This latter system includes a light source as well as a light-deflecting reflector or prism which directs the light toward the eye which is to be examined. A rotary lens wheel is carried by the housing for situating a selected one of a plurality of lenses along an observation path of the system so that when the operator looks through the selected lens he will see the background of the eye which is to be examined. The rotary lens wheel is transparent and has an inner surface directed toward the interior of the housing and an outer surface carrying indicia which identifies several lenses and is directed toward the operator. A light-conducting structure is situated in the interior of the housing to direct light from the light source to the rear of the transparent lens wheel so that this wheel will be illuminated even in the dark in order to render the indicia visible to the operator so that the operator will know which of the lenses is located at the observation path.



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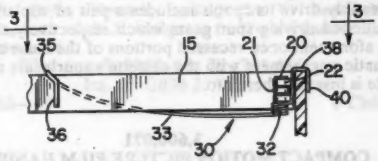
## 3,600,068
## SPRING ATTACHMENT FOR EYEGLASS FRAMES

Charles R. Jolicoeur, Jr., Rte. 1 Nugent Ave., Addison, Ill., and James R. Dempsey, 1433 S. Mohawk, Roselle, Ill.

Filed Apr. 14, 1969, Ser. No. 815,823
Int. Cl. G02c 5/16; F16f 1/10
U.S. Cl. 351—113 2 Claims



A spring attachment for the hinge ends of the temples of eyeglass frames which serve to urge the temples toward the folded position when the eyeglasses are in use so as to apply sufficient pressure against the head of the wearer to prevent movement of the eyeglasses out of proper position when the wearer moves his head out of normal upright position in leaning over or the like.

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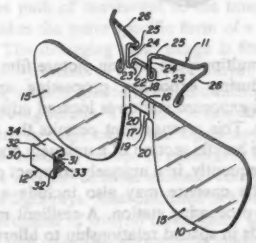
## 3,600,069
## AUXILIARY CLIP-ON SPECTACLE

Albert G. McNeill, Maple Glen, Pa., assignor to Bachmann Bros., Inc., Philadelphia, Pa.

Filed Sept. 24, 1969, Ser. No. 860,486
Int. Cl. G02c 9/04
U.S. Cl. 351—47 4 Claims



A lens structure having a pair of lens parts and a connecting bridge, and a resilient wire structure specifically con-

figured for conforming engagement about the bridge and hooked engagement over primary spectacles.

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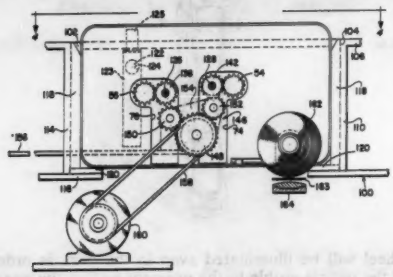
3,600,070

## CASSETTE MOTION PICTURE SYSTEM WITH UNIQUE GEAR ENGAGEMENT ARRANGEMENT

Rogers B. Downey, Lexington, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Nov. 3, 1969, Ser. No. 873,279
Int. Cl. G03b *23/02, 21/44*
U.S. Cl. 352—72 15 Claims



A motion picture system employing a cassette having a pair of coplanar spools to which the opposite ends of a strip of photographic material are connected. To facilitate reversible transport of the film strip between the aforementioned spools and across a film gate of the cassette, a spur gear is axially connected to each spool and positioned in one extremity of a specially configured recessed portion of the generally flat exterior surface of one cassette sidewall. Photographic apparatus adapted to receive such cassette and to alternately reversibly drive its spools includes a pair of coplanar fixedly positioned driving spur gears which respectively slide along the aforementioned recessed portions of the cassette into automatic engagement with the cassette's spur gears as the cassette is inserted thereinto.

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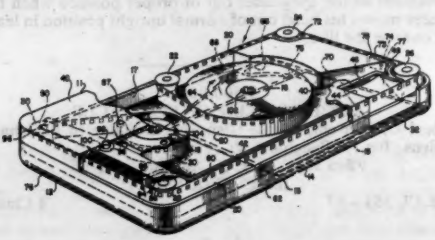
3,600,071

## COMPACT MOTION PICTURE FILM HANDLING CASSETTE AND CAMERA

Rogers B. Downey, Lexington, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Apr. 4, 1969, Ser. No. 813,427
Int. Cl. G03b *23/04*; G03c *5/28*
U.S. Cl. 352—78 11 Claims



A compact multipurpose motion picture film handling cassette useful during exposure, processing and projection operations. An exposure station is located adjacent a corner of the cassette. This arrangement permits the cassette to be mounted in the handle section of a uniquely compact camera and, then subsequently, in a uniquely compact processor-projector unit. The cassette may also include a normally inoperative film processing station. A resilient member of the cassette extends in spaced relationship to idlers intermediate of the exposure station and the cassette's takeup reel and the cassette includes means to receive a force applying member into operative relationship with this resilient member. This resilient member automatically snubs the adjacent idlers when mounted in the camera and is adapted to selectively snub these same idlers when the cassette is in the processor-projector unit.

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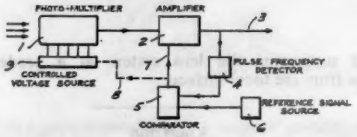
3,600,072

## SENSITIVITY CONTROL DEVICE IN RECEIVERS FOR OPTICAL SIGNALS

Lars-Erik Skagerlund, Karlskoga, Sweden, assignor to Aktiebolaget Bofors, Bofors, Sweden

Filed Apr. 10, 1969, Ser. No. 814,897
Claims priority, application Sweden, Apr. 17, 1962, 5,145
Int. Cl. G01c *3/08*
U.S. Cl. 356—4 2 Claims




A photomultiplier for generating electric pulses in response to impinging light has connected to its output a signal transmission device including threshold means so that pulses generated by the photomultiplier are passed through the transmission device only if their amplitude exceeds a threshold value. A pulse frequency detector is connected to the output of the transmission device to produce an output signal depending on the pulse repetition frequency of the pulses passed by the transmission device. This output signal is applied to control the relation between the threshold value and the amplitude of the pulses generated by the photomultiplier.

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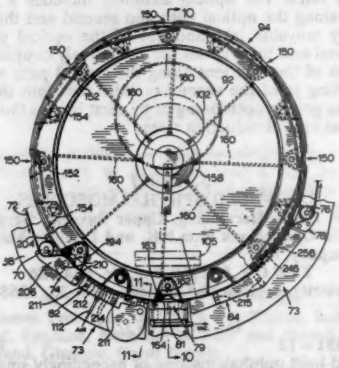
3,600,073

## ROLLING LOOP FILM TRANSPORT MECHANISM

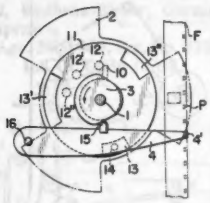
William Chester Shaw, Streetsville, Ontario, Canada, assignor to Multiscreen Corporation Limited, Galt, Ontario, Canada

Filed Nov. 24, 1969, Ser. No. 879,464
Int. Cl. G03b *1/20*
U.S. Cl. 352—184 25 Claims



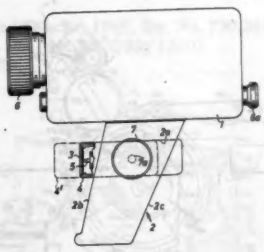
A rolling loop mechanism for transporting photographic film through a motion picture apparatus. The mechanism includes a rotor having gaps for receiving and forming loops to transport the film, and a stator which guides the film between a film inlet and a film outlet. Fixed locating pins are provided for locating the film relative to an aperture and a decelerating mechanism is adapted to engage and decelerate the film to locate the film on the fixed pins. Each gap in the rotor is fed from a pressurized gas source for cushioning the blow caused by the rotor striking a growing loop as the film is fed in from the inlet.

3,600,074
**FILM FEEDING DEVICE IN MOTION-PICTURE PROJECTORS**
Yasuo Ueno, Ohmiya-shi, Japan, assignor to Fuji Shashin Koki Kabushiki Kaisha, Ohmiya-shi, Japan
Filed Sept. 8, 1969, Ser. No. 856,074
Int. Cl. G03b *1/22*
U.S. Cl. 352—194 2 Claims



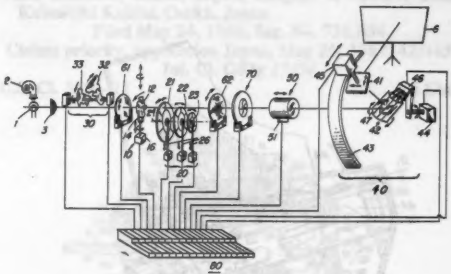
A claw member having a claw for feeding a film by engagement with the film perforation is pivotally connected to the frame of a projector. A cam is fixedly mounted on a power-driven main shaft for causing a film feeding motion of the claw member, whereas a disc cam is rotatably mounted on the main shaft for bringing the claw into or out of engagement with the film perforation. The phase relation between the cam and the cam disc can be selected by selectively engaging a pin on a gear which is rotatably and axially slidably mounted on a main shaft and driven from said main shaft through a reduction gearing, with one of pins mounted on the disc cam, whereby the speed of the film is changed stepwise without changing the speed of a sector.

3,600,075
**PHOTOGRAPHIC APPARATUS WITH DIAPHRAGM-ACTUATED RELEASE**
Alfred Winkler, Munich, Germany, assignor to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany
Filed Feb. 19, 1970, Ser. No. 12,205
Claims priority, application Germany, Feb. 21, 1969, G 69 06 842
Int. Cl. G03b *17/00*; H01h *3/12*
U.S. Cl. 352—244 14 Claims



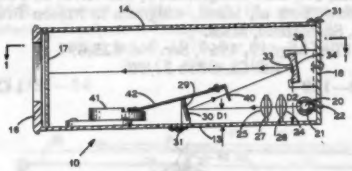
A motion picture camera wherein the body or the pistol grip handle supports an adjustable carrier for a deformable diaphragm which acts as a trigger to close a switch or to transmit motion to a mechanical camera release. The carrier is reciprocable with reference to the body or handle in parallelism with the optical axis of the objective or is mounted on a universal joint so that the diaphragm is movable to a position in which it is readily accessible to a finger on the hand which grips the handle.

3,600,076
**LIGHT BRUSH**
Edward Carlton Synder, 127 W. 96th St., New York, N.Y.
Filed Oct. 29, 1969, Ser. No. 872,189
Int. Cl. G03b *21/28*, *21/00*
U.S. Cl. 353—20 9 Claims



An optical projection device is provided with means to create and vary a light image. The image can be varied in form, number, color, attitude, focus, and illumination intensity. The image can be caused to move about and caused to vibrate in intensity. Each of the image variables is controlled by a keyboard such that a particular image status can be recalled by proper key manipulation. The resulting image variations are useful as a form of artistic expression.

3,600,077
**ELECTRICAL INDICATING INSTRUMENTS**
Antonio S. Paiva, Newark, and Justin V. Paulauskas, Elizabeth, both of, N.J., assignors to Weston Instruments, Inc., Newark, N.J.
Filed Aug. 9, 1968, Ser. No. 751,436
Int. Cl. G03b *21/10*
U.S. Cl. 353—40 6 Claims



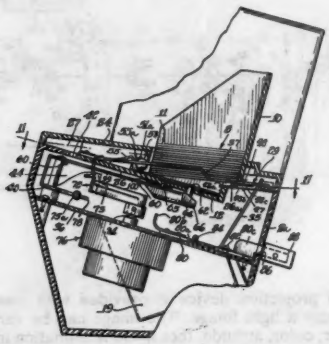
An indicating instrument is described which displays the value of some driving or control signal on a viewing screen as a sharp, bright image which is devoid of noticeable light-dispersion effects, such as image shadowing or rainbowing. This result is accomplished by focusing a concentrated light beam onto the path of movement of the image-forming element which takes the more specific form of a movable transparent vane. The diverging vane image is focused onto the viewing screen by means of a concave mirror having its concave reflecting surface spaced from, and facing, the back surface of the viewing screen. The vane is caused to move in the prescribed path in response to the signal applied to the instrument. The concave mirror is preferably of spherical or aspheric shape and serves as an efficient collector and reflector of incident light rays. Also disclosed is a panel-mountable indicating instrument of overall rectangular shape and a flat and relatively thin edgewise appearance made possible by an optical system which provides vane images having the above-described characteristics.

3,600,078

## SLIDE FEEDING APPARATUS

Edward J. Michniewicz, Niles, Ill., assignor to Argus Incorporated, Chicago, Ill.

Continuation-in-part of Ser. No. 660,737, Aug. 15, 1967, Pat. No. 3,495,902
Filed Feb. 16, 1970, Ser. No. 11,421
Int. Cl. G03b 23/02
U.S. Cl. 353—112 3 Claims



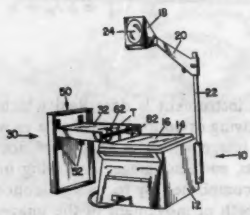
A slide feeding member is mounted for reciprocating movement along a raised ledge to push a bottommost slide of a stack of slides resting on said ledge onto a slide receiving track therebelow, the slide feeding member having a slide engaging portion for engaging the rear edge of a slide to push the same off the ledge, and a catcher lip-forming portion below and immediately in front of the slide engaging portion for supporting a slide pushed off the ledge and leaving contact with said slide engaging portion, so the slide continues to be moved forwardly after clearing the ledge.

3,600,079

## TRANSPARENCY HOLDER AND VIEWING DEVICE

Luke J. Smith, Jr., East Longmeadow, and Alvin R. Pottern, Longmeadow, both of, Mass., assignors to Milton Bradley Company, Springfield, Mass.

Filed May 19, 1969, Ser. No. 825,697
Int. Cl. G03b 21/00
U.S. Cl. 353—120 1 Claim



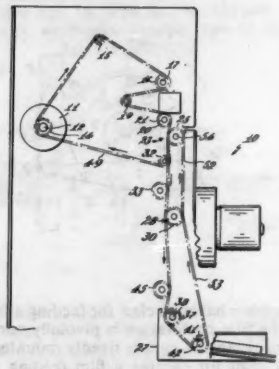
The combination with a projector for displaying transparencies of a device for the storage, selection and display of transparencies contained therein and comprising, a traylike container for the transparencies and having an open end, a cover adapted to enclose the container when the device is not in viewing use and adapted to support the container relative to the projector when the device is in viewing use, and guide means in the form of one of more wire rods for guiding the transparencies between stored and ready-to-view positions within the container and viewing positions on the projector.

3,600,080

## HINGED CHAIN DRIVE ASSEMBLY

Thaddeus W. Czernik, Greenville, R.I.; Robert E. Kasabula, North Grafton, Mass., and Lionel G. Gagnon, Millbury, Mass., assignors to Dennison Manufacturing Company, Framingham, Mass.

Filed Apr. 30, 1969, Ser. No. 820,536
Int. Cl. G03g 15/22
U.S. Cl. 355—3 8 Claims



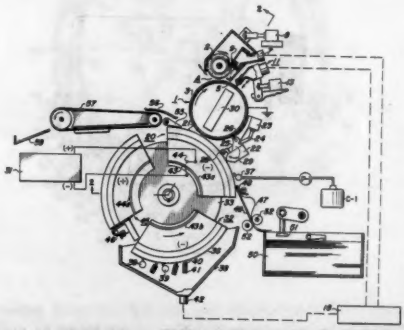
A hinged chain drive assembly for driving a plurality of elements mounted within an apparatus from a single driving motor source, some of such elements being mounted on a fixed portion of the apparatus and others of such elements being mounted on a movable hinged door for providing access to the interior of the apparatus. Chain drive subassemblies are arranged to allow the access door to be moved from a closed to an opened position without disturbing the operation of the apparatus and without requiring the removal of the endless chain elements used in the chain drive subassemblies.

3,600,081

## IMAGING APPARATUS

Raymond K. Egnaczak, Williamson, N.Y., assignor to Xerox Corporation, Rochester, N.Y.

Filed Nov. 14, 1969, Ser. No. 876,642
Int. Cl. G03g 15/00
U.S. Cl. 355—3 15 Claims



A machine for automatically producing images from photoelectrophoretic suspensions including a cylindrical transparent electrode which produces images by a slit scanning optical system internal to the cylindrical electrode and accomplishes processing by an arrangement having a plurality of imaging electrodes and a transfer electrode mechanism interface with the surface of the cylindrical trans-

parent electrode at a single position where the scanning optical image is projected. The imaging electrodes are supplied with suspension or solvent, as is required by the process, prior to their interfacing with the cylindrical transparent electrode and a sheet of support material is interjected on the transfer electrode prior its interfacing with the cylindrical electrode. Each of the interfacing electrodes are cleaned before reinterfacing and the transparent cylindrical electrode is cleaned after interaction with the transfer electrode.

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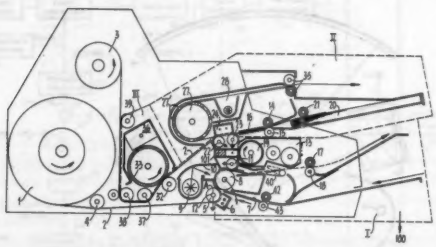
**3,600,082**
**COPYING APPARATUS**
**Wilhelm Knechtel, Rodheim-Bieber, Germany, assignor to The Singer Company**
**Filed Apr. 30, 1969, Ser. No. 820,531**
**Int. Cl. G03g *15/00***
**U.S. Cl. 355—8** **3 Claims**



An electrostatic copying machine in which a charge carrier in the form of a web or tape having a photoconductive surface is conducted from a supply reel through the apparatus by means of guide rollers past a plurality of component elements for the production of an electrostatic intermediate image for transfer, when developed, onto ordinary paper for the final copy, thence onto a takeup reel. Such component elements include a charging station, an exposure station for forming a latent image on the web, a developing station, an image transfer station where the developed image is transferred onto ordinary paper and a fusing station wherein the transferred image is fixed on the copy paper. In such a machine certain functional units of the device are removable to enable the initial threading of the photoconductive web through the various stations.

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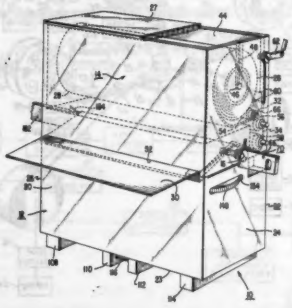
**3,600,083**
**ELECTROSTATIC PRINTING SYSTEM EMPLOYING A REPLACEABLE CARTRIDGE TO PROVIDE A SUPPLY OF A RECORDING ELEMENT AND PROCESSING MEANS THEREFOR**
**Marvin A. Leedom, Warminster, Pa., assignor to RCA Corporation**
**Filed Feb. 14, 1969, Ser. No. 799,391**
**Int. Cl. G03g *13/10***
**U.S. Cl. 355—10** **8 Claims**



A replaceable cartridge, adapted to be removably installed in an electrostatic printing system, provides a supply of a recording element and charging, developing, and cutting means therefor. Means are provided to convey and to guide the recording element through the cartridge along a path including charging, image exposing, developing, and cutting stations.

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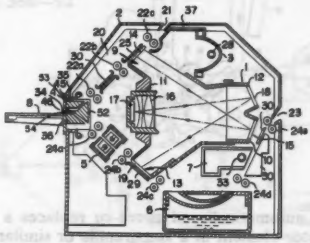
**3,600,084**
**DUPLICATING MACHINE OF REFLEX TYPE**
**Teizo Kushima, Osaka, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan**
**Filed May 24, 1968, Ser. No. 731,854**
**Claims priority, application Japan, May 26, 1967, 42/44321**
**Int. Cl. G03g *15/04***
**U.S. Cl. 355—11** **6 Claims**



A duplicating machine of a reflex type, such as a duplicating machine or an electrostatic duplicating machine of such type, comprises passage means constituting separated passages for originals and for photosensitive paper both of which are to be brought into an integral machine body through said passage means, a mirror-lens optical means having lens elements and a mirror, a photographing opening in the original passage, an image forming port in the photosensitive paper passage, a mirror reflecting the light from the original at the photographing opening onto the mirror-lens optical means, and a further mirror directing the light from the mirror-lens optical means to the image forming port. The above components are positioned to form three intersections of the light in the light path.

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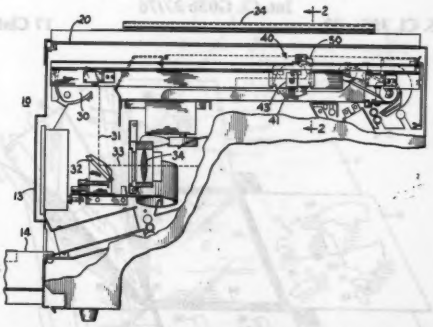
**3,600,085**
**COUNTER FOR PHOTOCOPY MACHINE**
**Donald R. Altergott, Highland Park, Ill., assignor to American Photocopy Equipment Company, Evanston, Ill.**
**Filed Jan. 9, 1970, Ser. No. 1,679**
**Int. Cl. G03g *15/00***
**U.S. Cl. 355—14** **5 Claims**

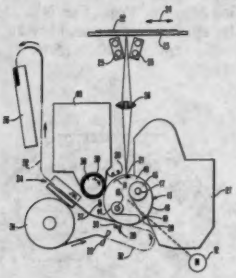


A counter mechanism for a photocopy machine of the type having a reciprocating table or carrier, the mechanism including a dial, which is set to show the desired number of copies, directly coupled to a ratchet wheel. The ratchet wheel is indexed by a pawl on the table during each copy-making stroke so that the setting of the dial is successively reduced to a reference setting at which point a switch is operated to terminate further cycling of the table.

## 3,600,086
## AUTOMATIC PHOTOCONDUCTOR ADVANCE MECHANISM FOR A XEROGRAPHIC COPYING MACHINE

**Joseph A. Cates, and William H. Sebastian, both of Lexington, Ky., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Filed Jan. 15, 1969, Ser. No. 791,412**
**Int. Cl. G03g** *15/00*
**U.S. Cl. 355—16** **5 Claims**

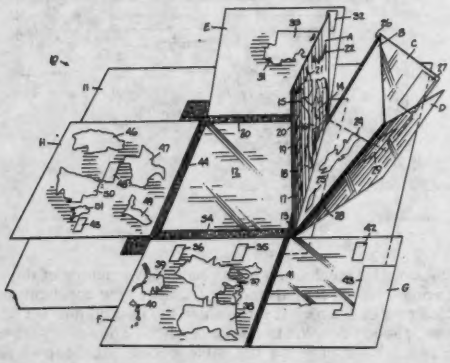


Apparatus automatically advances or replaces a reusable photoconductor element in a xerographic or similar copying machine is disclosed. The photoconductor element is stored in flexible strip form on supply and takeup rolls located within the interior of a copy drum. A counter is actuated each time a copy is produced. When a preset number of copies has been made the copy machine is automatically cycled into a photoconductor advance mode which causes a new length of photoconductor element to be drawn from the supply roll and disposed in operative relation about the outer periphery of the copy drum. A second counter records the number of times the photoconductor element is advanced and provides an indication to the operator when the supply of photoconductor element has been exhausted. Various electrical interlock and sequencing circuits are incorporated to prevent damage to the apparatus during a photoconductor advance cycle.

## 3,600,087
## METHOD OF MAKING A MULTICOLOR SLIDE TRANSPARENCY AND THE PRODUCED SLIDE TRANSPARENCY

**Jack L. Goodman, Chappaqua; Lynne P. Brown, Tarrytown, and Dorothy A. Podesta, Bronx, all of, N.Y., assignors to Harcourt, Brace & World, New York, N.Y.**

**Filed June 6, 1968, Ser. No. 735,059**
**Int. Cl. G03b** *27/76*
**U.S. Cl. 355—32** **17 Claims**

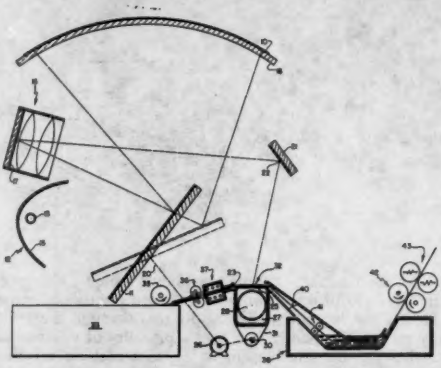


The slide transparencies are made for projection in daylight without the use of screens. The slide transparencies are prepared by sequentially exposing a film to different combinations of registered overlays. The overlays include transparent and opaque areas with preselected portions of the transparent areas covered by transparent colored gels. Each exposure of a film forms an image on the film corresponding to the color and pattern of light passing through the registered overlays. The film is then used to make the slide transparencies.

## 3,600,088
## SCANNING OPTICAL SYSTEM

**Henry G. Joel, New York, N.Y., assignor to Ing. C. Olivetti & C.S.p.A., Ivrea, Italy**

**Filed Dec. 22, 1969, Ser. No. 887,177**
**Int. Cl. G03b** *27/50*
**U.S. Cl. 355—47** **10 Claims**

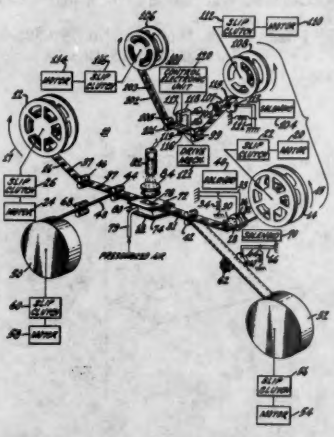


An optical system is provided for projecting an image of a fixed original onto a moving receiving surface comprising a rotating mirror which combines the two processes of directing a scanning beam of light against the original from a fixed source and directing the image modulated reflected light to a fixed objective lens.

## 3,600,089
## FILM MERGING UNIT

**Gerard O. Walter, Skillman, N.J., assignor to RCA Corporation**

**Filed Jan. 10, 1969, Ser. No. 790,349**
**Int. Cl. G03b** *27/04, 27/52*
**U.S. Cl. 355—99** **6 Claims**



A film merging unit that automatically updates an old master film with data contained on an updating film by

producing a new film with the old and the new data correctly merged thereon. A control device is present for reading a control strip containing coded marks and producing control signals to activate selected drive mechanism to sequence the relative positionings of the films with respect to the printing station.

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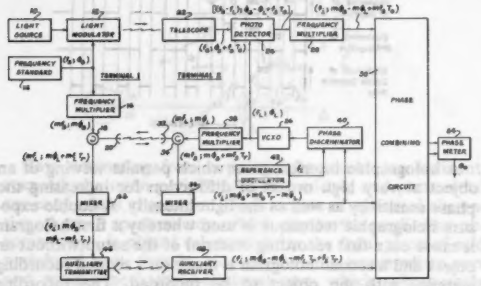
**3,600,090**

## EXTENDED RANGE OPTICAL DISTANCE MEASURING INSTRUMENT

**Lockett E. Wood, and Moody C. Thompson, Jr., both of Boulder, Colo., assignors to The United States of America as represented by the Secretary of Commerce**

**Filed Sept. 26, 1969, Ser. No. 861,303**
**Int. Cl. G01c** *3/08*
**U.S. Cl. 356—5** **7 Claims**




A pair of terminals disposed at opposite ends of a path whose distance is to be measured. The first terminal includes an oscillator for generating a stable frequency signal which is transmitted to the second terminal as modulation on a light beam and as a frequency multiplied radio signal. The second terminal includes a local oscillator whose signal is frequency multiplied and then phase-locked a small interval from the received radio signal. The local oscillator signal (before multiplication) is used to heterodyne the modulation on the received light beam. The multiplied local oscillator signal is radiated to the first terminal where it is mixed with the frequency multiplied stable frequency signal to obtain an intermediate frequency signal that is transmitted back to the second terminal via an auxiliary radio link. The received intermediate frequency signal and the intermediate frequency signals from the phase locking loop and the light heterodyning circuit (after frequency multiplication) are then combined to yield a signal whose phase is proportional to the optical range.

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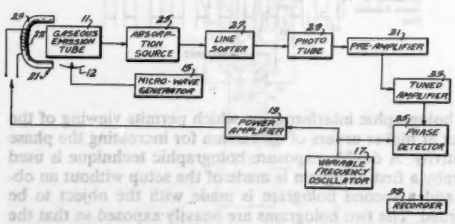
**3,600,091**

## BRIGHT-LINE EMISSION SOURCE FOR ABSORPTION SPECTROSCOPY

**Joseph A. Goleb, Naperville; James P. Bobis, Downers Grove, and Forrest R. George, Plainfield, all of, Ill., assignors to The United States of America as represented by the United States Atomic Energy Commission**

**Continuation-in-part of application Ser. No. 639,254, May 12, 1967, now abandoned. This application May 13, 1970, Ser. No. 36,723**
**Int. Cl. G03b** *27/04;* **H01j** *1/50*
**U.S. Cl. 356—85** **3 Claims**




An improved light source for atomic absorption spectroscopy consisting of a gas discharge tube containing, as a gas, the element to be analyzed. The gas-filled tube is subjected to high-frequency electromagnetic radiation which excites the atoms of the gas, causing them to emit a constant-intensity light. By subjecting the gas-filled tube to a relatively low-frequency time-varying magnetic field, the light emitted therefrom is intensity or amplitude modulated to the frequency of the field.

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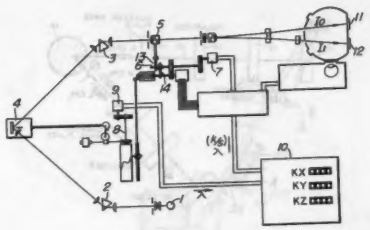
**3,600,092**

## APPARATUS FOR MEASURING DENSITY STIMULUS VALUES OF THREE PRIMARY COLORS

**Murata, Yukio, Takarazuka-shi, Japan, assignor to Sumitomo Chemical Company, Ltd., Osaka, Japan**

**Filed July 17, 1967, Ser. No. 653,887**
**Claims priority, application Japan, July 20, 1966, 41/47884**
**Int. Cl. G01j** *3/46, 3/50*
**U.S. Cl. 356—92** **3 Claims**




A recording spectrophotometer for measuring the color density of a colored surface necessary for calculating a recipe of color matching based on a colorimetric method, characterized by an integrator capable of calculating density stimulus values of the three primary colors, and an output converter capable of converting the reflectance measured by a photometer to a physical value which is in proportion to the optical density.

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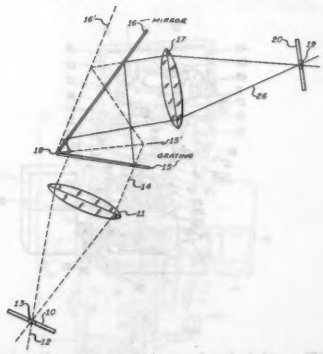
**3,600,093**

## CONTINUOUSLY BLAZED OPTICAL MONOCHROMATOR

**Donald H. McMahon, Carlisle, Mass., assignor to Sperry Rand Corporation**

**Filed Nov. 10, 1969, Ser. No. 875,138**
**Int. Cl. G01j** *3/18;* **G02b** *5/18*
**U.S. Cl. 356—100** **11 Claims**




A monochromator comprising a plane mirror and a substantially planar grating which operates at the blaze angle throughout a predetermined range of input wavelengths. The mirror and grating are disposed in vertically oriented intersecting planes and rigidly affixed to one another for common rotation about the vertical axis of intersection. Light passing through the entrance aperture of the instrument and imping-

ing on the grating is diffracted thereby onto the mirror from which it is then reflected toward an exit aperture, the wave length selected for transmission through the exit aperture being determined in accordance with the angular position of the grating-mirror combination about its rotational axis.

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**3,600,094**

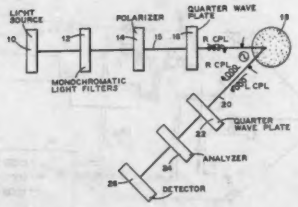
**SUSPENDED SOLIDS CONCENTRATION MEASUREMENT USING CIRCULAR POLARIZED LIGHT**

**John W. Liskowitz, Belle Meade, N.J., assignor to American Standard Inc., New York, N.Y.**

**Continuation-in-part of application Ser. No. 629,568, Apr. 10, 1967. This application Nov. 12, 1968, Ser. No. 774,895**

**Int. Cl. G01n** *15/02, 21/00, 21/40*

**U.S. Cl. 356—102** **15 Claims**




A device for optically measuring the amount of particulates in a fluid. Circularly polarized light is directed at a fluid to be analyzed and light which is scattered preferably in a backward direction, that is more than 90° from the direction of the incident beam is analyzed and the ratio of the intensity of light resulting from multiple scattering to the intensity of light resulting from both multiple and primary scattering is determined.

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**3,600,095**

**DIFFERENTIAL RING LASER**

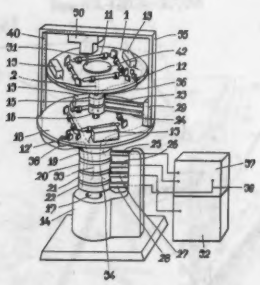
**Keiichi Tanaka, Tokyo, Japan, assignor to Agency of Industrial Science & Technology, Tokyo, Japan**

**Filed Apr. 2, 1969, Ser. No. 812,674**

**Claims priority, application Japan, May 9, 1968, 43/30535**

**Int. Cl. G01b** *9/02, 11/26*

**U.S. Cl. 356—106 LR** **1 Claim**



A differential ring laser comprising a disc on which a ring laser, an interferometer and a phototube are fixed. A second disc is arranged coaxially with the disc, under the same and provided with the same ring laser, interferometer and phototube as the disc. Means are provided for independently rotating the two discs and there is a counter for counting the difference between the number of beat waves detected by the phototubes on the two discs.

**3,600,096**

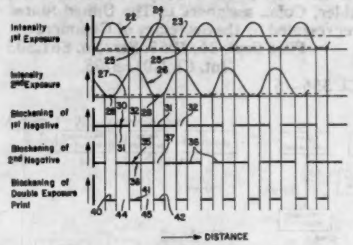
**HOLOGRAPHIC INTERFEROGRAMS WITH INCREASED LIGHT INTENSITY**

**Lee O. Heflinger, Torrance, and Robert E. Brooks, Redondo Beach, both of, Calif., assignors to TRW Inc., Redondo Beach, Calif.**

**Filed July 31, 1969, Ser. No. 846,358**

**Int. Cl. G01b** *9/02;* **G02b**

**U.S. Cl. 356—106** **5 Claims**




A holographic interferogram which permits viewing of an object at very high orders of diffraction for increasing the phase sensitivity as well as the light intensity. A double-exposure holographic technique is used whereby a first hologram is made on a first recording material of the setup without an object and a second hologram is made on a second recording material with the object to be recorded. The recording materials are heavily exposed so that the fringe lines corresponding to minimum light intensity are narrow compared to the fringe spacing. They are reproduced on a third recording material by successively exposing the first recording material and displacing it by a predetermined fraction of the fringe spacing $1/n$ where $n$ is the number of exposures. The second recording material is similarly reproduced on the same third recording material. The thus obtained new hologram may be reconstructed by viewing it in the light diffracted into a very high order. In this manner not only is the phase sensitivity multiplied by the order by which the object is viewed, but also the light intensity is much increased.

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**3,600,097**

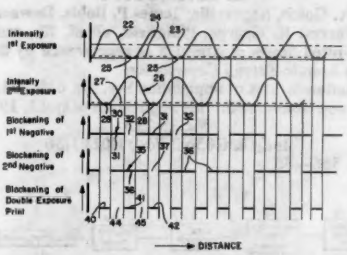
**HOLOGRAMS HAVING INCREASED PHASE SENSITIVITY**

**Lee O. Heflinger, Torrance, Calif., assignor to TRW Inc., Redondo Beach, Calif.**

**Filed July 31, 1969, Ser. No. 846,463**

**Int. Cl. G01b** *9/02;* **G02b**

**U.S. Cl. 356—106** **5 Claims**




A holographic interferogram which permits viewing of the object at higher orders of diffraction for increasing the phase sensitivity. A double exposure holographic technique is used whereby a first hologram is made of the setup without an object and a second hologram is made with the object to be recorded. The two holograms are heavily exposed so that the fringe lines corresponding to minimum light intensity are narrow compared to the fringe spacing. The clear and dark areas

of the two holograms are then reversed and combined, for example, by contact printing. This new hologram may now be reconstructed by viewing it in the light diffracted into a predetermined higher order. As a result, the phase sensitivity is multiplied by the order by which the object is viewed.

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**3,600,098**

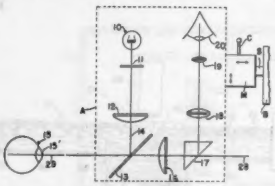
**OPTICAL ALIGNMENT METHOD AND APPARATUS**

**Richard C. Mohrman, Irondequoit, N.Y., assignor to Bausch & Lomb Incorporated, Rochester, N.Y.**

**Filed Dec. 29, 1969, Ser. No. 888,641**

**Int. Cl. G01b** *11/27*

**U.S. Cl. 356—153** **5 Claims**



Rays emanating from a point light source are incident, respectively, upon peripheral, intermediate, and paracentral zones of a lens chosen for a high degree of spherical aberration. A small aperture stop, which may be the pupil of an observer's eye, is placed substantially in the focal plane of said peripheral rays, thereby blocking out the intermediate rays and passing both the peripheral rays, which subsequently form an annular image, and the paracentral rays, which subsequently form an image of the point source. Between the aberrating lens and the aperture stop, the rays are reflected from a specular surface which is known to have a perpendicular relationship to an optical axis sought to be aligned. For example, the corneal surface of an ophthalmic patient's eye might be the specular surface, where the optical axis of said eye is sought to be aligned to the optical axis of an analytical instrument. By arranging the light source, the aberrating lens and the aperture stop in fixed relationship to an optical axis and maintaining the fixed unity of the source, lens, stop and axis while varying their position relative to that of the specular surface until the point image is brought to the center of the annular image, the two optical axes are aligned to one another.

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**3,600,099**

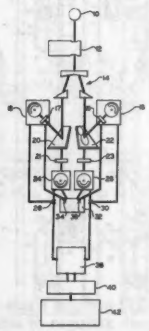
**THIN LAYER CHROMATOGRAPHIC APPARATUS FOR COMPARING A SAMPLE AND A REFERENCE**

**Dietmar M. Schoeffel, Hillsdale, N.J., assignor to Schoeffel Instrument Corp., Westwood, N.J.**

**Continuation-in-part of application Ser. No. 710,151, Mar. 4, 1968, now abandoned. This application Apr. 7, 1970, Ser. No. 26,309**

**Int. Cl. G01n** *21/22, 21/30*

**U.S. Cl. 356—206** **13 Claims**



Apparatus for the optical comparison of a moving reference and sample applied to a moving, thin layer, chromatographic plate having a light source, a monochromator, means for splitting the beam from the light source which is transmitted through the monochromator, means for applying the split beam to the closely adjacent reference and sample, means for detecting the ratio between the optical characteristics of the reference and the sample, and means for displaying the ratio.

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**3,600,100**

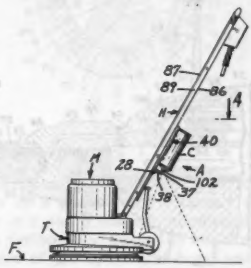
**DEVICE FOR DISPENSING A LIQUID FROM A PRESSURIZED CAN ON A FLOOR TREATING MACHINE**

**Daniel A. Arones, Wayzata, Minn., assignor to Advance Machine Company, Spring Park, Minn.**

**Filed Mar. 4, 1969, Ser. No. 804,161**

**Int. Cl. A46l** *1/08;* **A46b** *11/00*

**U.S. Cl. 401—138** **3 Claims**




A floor machine having a floor treating head for engaging a floor and a handle connected to the head, the combination of a support, means for mounting the support on the extension together with means for mounting a pressurized can having a release nozzle thereon in the support and a lever mechanism mounted in the handle contactably with the nozzle for actuating the same to dispense the contents of the can upon the floor when the lever means is actuated.

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**3,600,101**

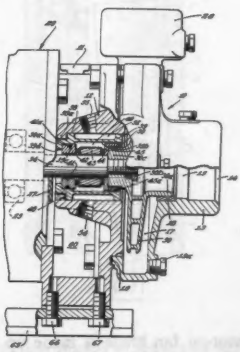
**COMPACT HIGH TEMPERATURE PUMP**

**Paul L. Oglesby, Moweaqua; Richard E. Reeves, Decatur, and William K. Haebich, Decatur, all of, Ill., assignors to Decatur Pump Company, Decatur, Ill.**

**Continuation-in-part of application Ser. No. 785,556, Dec. 20, 1968. This application Dec. 22, 1969, Ser. No. 887,209**

**Int. Cl. F01d** *11/00;* **F16j** *15/00*

**U.S. Cl. 415—111** **10 Claims**



A compact, inexpensive, high temperature pump includes a shaft seal cavity area separated from an impeller cavity area by a film-thin passageway whereby a small portion of a first high temperature fluid may flow from the impeller cavity

to the seal cavity through the passageway. A press-fit throttle bushing having a recess in its outer surface is press-fit into a bore to provide a separate passageway for a second low temperature fluid. The throttle bushing or fluid jacket extends around the outside and in heat transfer relationship to the seal cavity and the passageway so that the portion of the first fluid is greatly cooled thereby allowing the use of conventional and inexpensive shaft seals for the high temperature pump.

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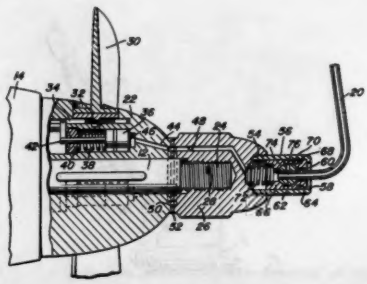
**3,600,102**
**CONTROL ASSEMBLY FOR CONTROLLABLE PITCH PROPELLER**

**Paul P. Dirlik, 4847-A South 28th St., Arlington, Va.**

**Filed July 14, 1969, Ser. No. 841,503**
**Int. Cl. B63h** *3/08*
**U.S. Cl. 416—157** **8 Claims**



A rotatable nut and hub assembly having fluid passages therein communicating with a piston and cylinder assembly to control the pitch of propeller blades attached to the hub and a connector at the outer end of the nut connected to a supply conduit for fluid with the connector including a ball with passageways incorporated therein received in a seat having one portion thereof movably engaged with the ball and held in position by a spring device whereby the fluid will lubricate the connector and the movable seat serves to enable bleeding of air from the control system.

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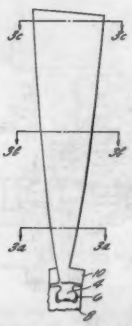
**3,600,103**
**COMPOSITE BLADE**

**David F. Gray, Wapping; Charles E. Doughty, Guilford, and Frank B. Pinney, East Granby, all of, Conn., assignors to United Aircraft Corporation, East Hartford, Conn.**

**Filed Oct. 6, 1969, Ser. No. 864,021**
**Int. Cl. F01d** *5/14*
**U.S. Cl. 416—224** **4 Claims**



A compressor or fan blade is made up of layers of high modulus fibers extending in parallel relation, and embedded in a metallic matrix, the successive layers of fibers varying in length and dimension so that, when stacked and compacted together, the desired blade configuration will be obtained. The blade may be made by a process including stacking the layers of fibers which are secured to a metallic supporting sheet, in the proper sequence, and then compacting the assemblage in dies under pressure and high temperature to cause the material of the several backing sheets to fill the voids among the fibers and form the matrix within which the fibers are embedded.

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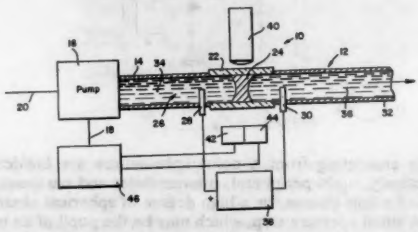
**3,600,104**
**METHOD AND APPARATUS FOR CONTROLLED PUMPING OF LIQUID MERCURY**

**Harry J. King, Canoga Park, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.**

**Filed Nov. 30, 1967, Ser. No. 687,020**
**Int. Cl. G01n** *27/42*; **F17d** *1/00*
**U.S. Cl. 417—48** **10 Claims**




A controllable flow of liquid mercury is discharged into a delivery conduit. First and second electrodes are positioned in the conduit in the liquid mercury therein. The conduit between the electrodes is electrically insulative. A bubble of electrolyte is positioned between the electrodes. An electrolysis current source is connected to the electrodes and regulated in accordance with the amount of mercury desired to be delivered by this delivery conduit. this electrolysis current electrolyzes mercury across the electrolyte from the mercury source toward the discharge end of the delivery conduit. Detection means detect the position of the electrolyte bubble and regulates the controllable flow of liquid mercury to maintain the electrolyte bubble in a substantially fixed position in the delivery conduit. Thus, the amount of mercury delivered out of the delivery conduit is equal to the amount of mercury electrolyzed across the electrolyte.

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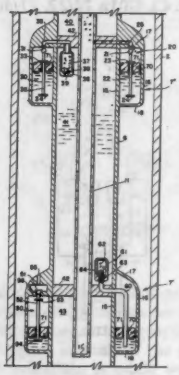
**3,600,105**
**GAS LIFT SYSTEM**

**Robert F. Berry, Dallas, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.**

**Filed May 7, 1969, Ser. No. 823,252**
**Int. Cl. F04f** *1/06*, *3/00*
**U.S. Cl. 417—132** **9 Claims**



A gas lift system that operates on a substantially nonvarying casing pressure and employs at least one gas lift device

which has a housing for accumulating liquid being displaced to the surface of the well and valve means associated with the housing for admitting liquid to the housing and removing liquid therefrom by way of casing pressure, the valve means associated with the housing being operable by a float means.

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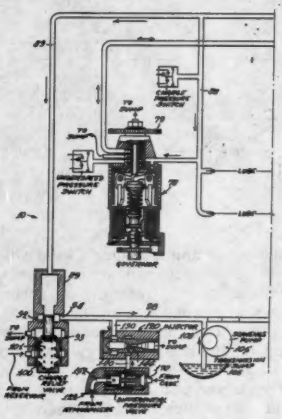
3,600,106
SELF-PRESSURIZING SCHEME
Stephen S. Baits, and Kenneth I. Brenner, both of Rockford, Ill., assignors to Sundstrand Corporation
Filed Aug. 13, 1969, Ser. No. 849,830
Int. Cl. F04f 5/48; F16h 47/04
U.S. Cl. 417—190 19 Claims



A case pressurization system for aircraft constant speed drives and certain other aircraft components employing housings with sumps including a venturi injector within the housing supplied fluid under pressure from a suitable source with a differential pressure valve for selectively supplying atmospheric air to the venturi injector when sump pressure falls to a predetermined value relative to atmospheric pressure with the injector directing air entrained fluid into the sump providing adequate inlet pressure for a scavenge pump withdrawing fluid from the sump.

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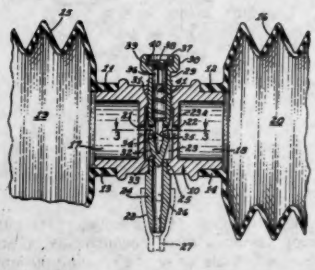
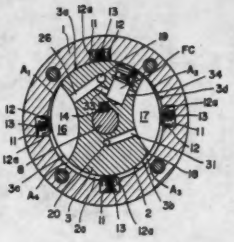
3,600,107
BELLOWS EXERCISER AND PUMP
Austin E. Elmore, 8519 E. Pasadena Ave., Scottsdale, Ariz., and Ernest A. Uhlmann, 5202 N. Saddle Rock Road, Phoenix, Ariz.
Filed Nov. 18, 1969, Ser. No. 877,736
Int. Cl. F04b 41/00, 39/10
U.S. Cl. 417—236 3 Claims



A pair of interconnected sylphon bellows or the like and a control valve adjustable to regulate discharge from the common passageway interconnecting the bellows, which discharge may be connected through a discharge line to actuate a device or pump up a container.

3,600,108
ROTARY PUMP
Tamaki Tomita; Sadamu Kato, and Hideo Mizoguchi, all of Kariya, Aichi, Japan, assignors to Toyoda Koki Kabushiki, trading as Toyoda Machine Works, Ltd., Kariya, Aichi Prefecture, Japan
Filed Aug. 25, 1969, Ser. No. 852,706
Claims priority, application Japan, Aug. 26, 1968, 43/61093
Int. Cl. F04c 1/00, 3/00
U.S. Cl. 417—294 9 Claims



A rotary pump comprises cam surfaces formed on the outer periphery of a pump rotor rotatably mounted in a cylindrical bore in a pump housing, abutments slidably contacting the cam surfaces and spaced at equal intervals about the circumference of the cylindrical bore, and separating a plurality of pump chambers formed within the cylindrical bore, and a flow control valve actuated by the centrifugal force imparted thereto by rotation of the pump rotor to maintain the pump discharge approximately constant.

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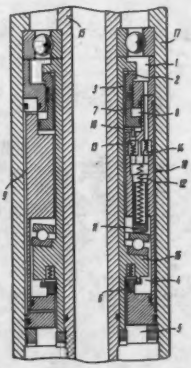
3,600,109
ARRANGEMENT TO SEAL THE SHAFT OF A DRILLING FACE ENGINE
Alexander Andreevich Pavlichenko, Kvartal 37, Korpus 11, kv. 5, and Andrei Yakovlevich Frolov, 11 Parkovaya 44, Korpus 3, kv. 119, both of Moscow, U.S.S.R.
Filed May 1, 1969, Ser. No. 820,910
Claims priority, application U.S.S.R., July 9, 1968, 1251349
Int. Cl. F04b 49/04, 1/12
U.S. Cl. 417—297.5 1 Claim

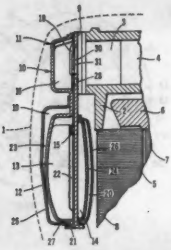


The present invention relates to sealing of shafts of mining face engines. The principal object of the invention is to eliminate the disadvantages of the known apparatus of this kind. To achieve this object it has a floating piston which compresses the face seal pair that opened under the effect of vibration, thereby restoring normal functioning of the seal.

## 3,600,110
## HERMETICALLY ENCLOSED REFRIGERATING MACHINE

Bendt Wegge Romer, Augustenborg; Lars Meisingset, Nordborg; Knud V. Valbjorn, Nordborg, and Jorgen Dahlman Knudsen, Gjesing pr. Esbjerg, all of, Denmark, assignors to Danfoss A/S, Nordborg, Denmark

Filed June 3, 1969, Ser. No. 23,083
Claims priority, application Germany, Mar. 16, 1968, P 16 01 859.0
Int. Cl. F04b 39/00
U.S. Cl. 417—312 11 Claims

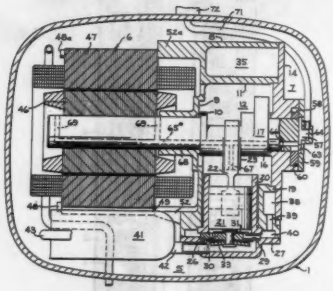


The invention relates to a hermetically enclosed refrigeration compressor unit. The unit includes two sheet metal chambers for reducing the sound due to pressure effects. The sound reducing chambers are shallow in construction and have a common interior wall which extends upwardly between the cylinder and head of the compressor where it forms a part of the valving. Another wall of the sound reducing chambers also extends upwardly and forms a part of the cylinder head.

## 3,600,111
## HERMETIC COMPRESSOR

Robert E. Rogers, Sidney, Ohio, assignor to General Electric Company

Filed Aug. 19, 1969, Ser. No. 851,280
Int. Cl. F04b 39/00, 35/04
U.S. Cl. 417—312 7 Claims

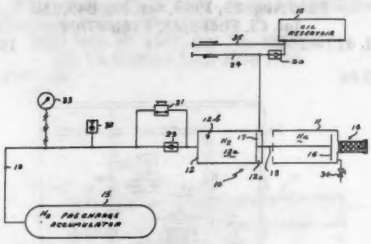


A hermetic compressor comprising a horizontal motor-compressor unit in which the motor component and a reciprocal compressor component are of substantially the same transverse configuration and are so arranged relative to one another as to provide a compact unit which can be housed in a symmetrical casing with all major portions of the unit spaced about the same distance from the casing walls.

## 3,600,112
## SOLID-PROPELLANT-ACTUATED HYDRAULIC POWER UNIT

Robert Lehner, Baltimore, and David Sylvester, Phoenix, both of, Md., assignors to The United States of America as represented by the Secretary of the Air Force

Filed Mar. 17, 1970, Ser. No. 20,279
Int. Cl. F04b 17/00, 35/02
U.S. Cl. 417—364 8 Claims

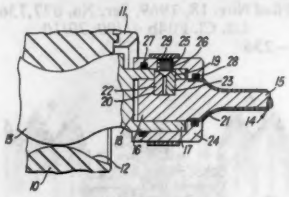


A hydraulic power unit including a solid propellant-hot-gas energy source, a gas accumulator communicating with the exhaust from the source, hydraulic oil accumulator, and a precharge gas accumulator supplying nitrogen gas under pressure to one side of the oil accumulator. Pressure formed by the firing of the hot-gas energy source-propellant acts against, and operates a double-piston mechanism consisting of a pair of separated pistons respectively arranged between the gas and oil accumulators to thereby compress the nitrogen gas in the oil accumulator by one side of the piston positioned therein. Hydraulic oil is simultaneously drawn from an oil reservoir into the oil accumulator on the other side of the said piston where it becomes pressurized by the precharged nitrogen gas for its later use in a hydraulically operated lift system.

## 3,600,113
## ROTARY PUMP OR MOTOR WITH AN AXIALLY ROTATING ROTOR

Hans Gunther Pahl, Brentwood, and Stanley George Woods, London, both of, England, assignors to Mono Pumps Limited, London, England

Filed Oct. 20, 1969, Ser. No. 867,666
Int. Cl. F01c 1/10, 5/00
U.S. Cl. 418—48 8 Claims



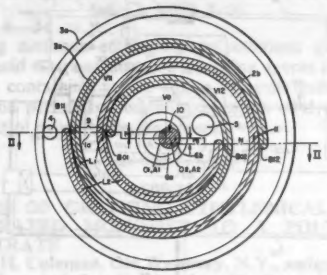
A rotary pump or motor, e.g. a helical gear pump, comprising a stator having a rotor eccentrically rotatable with respect thereto, a flexible drive shaft having an end portion located in a recess in the rotor, key means located in transversely aligned apertures formed in the recess and the end portion of the shaft, to key the drive shaft to the rotor, to drive the rotor or receive drive therefrom, the flexible drive shaft being coated with a nonpermeable and nonporous layer.

3,600,114

## INVOLUTE PUMP

Miloslav Dvorak, and Arnost Lepsi, both of Velesin, Czechoslovakia, assignors to Leybold-Heraeus-Verwaltung GmbH, Cologne-Bayental, Germany

Filed July 18, 1969, Ser. No. 843,069
Claims priority, application Czechoslovakia, July 22, 1968, Sept. 11, 1968, 5354-68;6370-68
Int. Cl. F01c 1/02; F04c 1/02, 17/02
U.S. Cl. 418—55 15 Claims



A fluid pump or motor is formed of two disks which are mounted parallel to each other and for rotation relative to each other. The opposed surfaces of the disks include substantially plane portions and projections extending from the substantially plane portions and interengaging with each other. These projections have the form of involutes of a circle of the same radius. Closed chambers are formed between the inside of one projection and the outside of another. These chambers constantly change in size during the circular movement of the disk relative to each other. By driving the disks and connecting the closed chambers to a source of fluid the device can be used as a pump; by supplying a fluid under pressure to the chambers the device can be used as a fluid motor.

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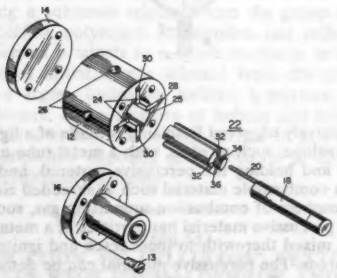
3,600,115

## FLUIDIC STEPPING MOTOR

John M. Rhoades, Waynesboro, Va., assignor to General Electric Company

Filed Feb. 27, 1969, Ser. No. 802,859
Int. Cl. F01c 1/04
U.S. Cl. 418—61 8 Claims



A pneumatically operated motor which yields discrete steps of rotation. The motor comprises a stator, a fluidically or pneumatically energized nutator which drives a pin located therewithin and which, in turn, is eccentrically coupled to an output shaft. A plurality of ports are located in the stator which surrounds the nutator, and an equal number of sliding vanes serve to provide a plurality of expansible chambers surrounding the nutator. Air pressure is vented into one port and vented from the opposite port. This difference in pressure across the nutator produces a force on the pin eccentrically attached to the output shaft and causes the output shaft to rotate until the forces on the pin balance. By applying pressure at successive ports, the motor can be stepped along in finite degrees of rotation, with the extent of the step depending solely upon the number of ports and the spacing thereof. Fluidic circuitry is also provided for controlling the fluidic energization of the nutator in accordance with command information supplied to the motor.

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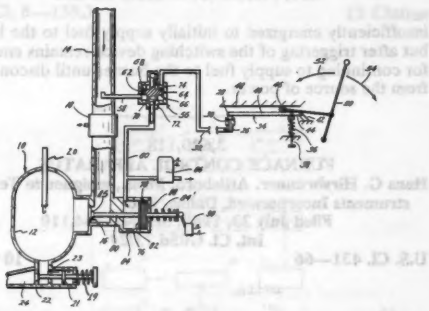
3,600,116

## AIR-CONTROL SYSTEM FOR APPARATUS DISPLACING MATERIAL BY COMBUSTIVE EXPLOSIONS

John M. Clark, Jr.; Allan R. Nye, and Charles D. Wood, all of San Antonio, Tex., assignors to Southwest Research Institute, San Antonio, Tex.

Filed Aug. 1, 1969, Ser. No. 846,682
Int. Cl. F23r 1/12
U.S. Cl. 431—1 9 Claims



An air control system for an apparatus displacing material by combustive explosions insuring that the air valve leading to the combustion chamber is closed during combustion. An air supply system for a combustive apparatus for displacing material in which the charging pressure of the air in the combustion chamber may be selected and controlled. An air control system for controlling the air inlet valve to the combustion chamber of an explosive material displacing apparatus having a relief valve with means for adjusting the pressure at which the relief valve opens with a control valve connected to and responsive to the relief valve and an air control line connected to the air supply in which the flow of air therethrough is controlled by the control valve, and a piston connected to the air inlet valve and exposed on one side to the pressure in the air control line whereby pressure passing through the control line acts on the piston in a direction to close the valve, and air bleed means connected to the air control line for relieving the air control line to allow the air inlet valve to be actuated. The air control system controlling the air supply valve to allow the full air supply pressure to be built up before charging the combustion chamber with air thereby allowing the air supply system to charge air to the combustion chamber at a higher charging rate.

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3,600,117

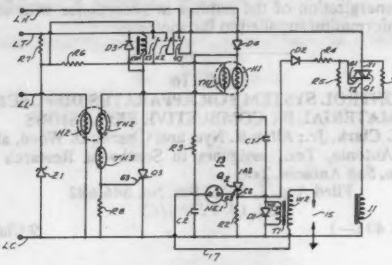
## FURNACE FUEL VALVE ENERGIZING CIRCUIT

Hans G. Hirsbrunner, Attleboro, Mass., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed May 8, 1969, Ser. No. 822,903
Int. Cl. F23n 5/12
U.S. Cl. 431—66 4 Claims

In an electrothermal furnace control, means for energizing the fuel valve, the fuel valve being an electrically energizable type requiring a higher level of energization for initially supplying fuel and a lesser level for continuing to supply fuel. A triggerable semiconductor current-switching device includes main terminals connected in a circuit with the main fuel valve to an AC power source. Means is provided for supplying triggering current to cause triggering of the switching

device for initially energizing the fuel valve at the higher level but ceases to supply the triggering current after ignition of the fuel. Means connect the fuel valve to the power source to supply energization at the lower level such that the valve is



insufficiently energized to initially supply fuel to the burner, but after triggering of the switching device remains energized for continuing to supply fuel to the burner until disconnected from the source of power.

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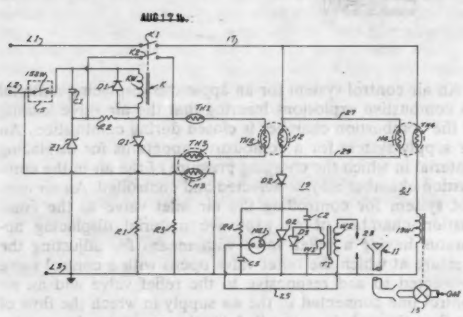
**3,600,118**
**FURNACE CONTROL APPARATUS**
**Hans G. Hirsbrunner, Attleboro, Mass., assignor to Texas Instruments Incorporated, Dallas, Tex.**
**Filed July 23, 1969, Ser. No. 844,110**
**Int. Cl. G05d *23/24***
**U.S. Cl. 431—66** **10 Claims**



In furnace control apparatus, circuitry for energizing an electrically energizable fuel valve of the furnace. A thermistor is connected for bistable operation in either an unheated first state or a self-heating second state, the thermistor being shifted from the first to the second state when momentarily heated above a predetermined threshold temperature. In the second state, the thermistor causes energization of the fuel valve for supplying fuel to the furnace burner. A heater for the thermistor is energized by a fuel demand signal and momentarily heats the thermistor above its threshold temperature, thereby causing fuel to be supplied to the burner in response to a demand for fuel.

This invention relates to apparatus for controlling operation of a furnace, and more particularly to such furnace control apparatus including improved circuitry for energizing an electrically energizable fuel valve of the furnace.

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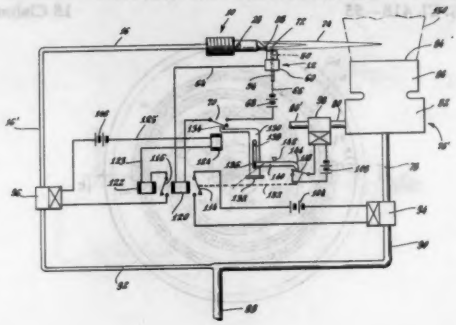
**3,600,119**
**IGNITOR APPARATUS**
**Howard M. Abbott, Jr., Southport, Conn., assignor to The Perkin-Elmer Corporation, Norwalk, Conn.**
**Filed Sept. 24, 1969, Ser. No. 860,641**
**Int. Cl. F23n *5/00***
**U.S. Cl. 431—67** **10 Claims**

An ignition assembly for lighting another device, such as a main burner (for example, the sampling burner of an atomic absorption spectrophotometer). An electrically heated igniter coil is placed at the edge of the gaseous (fuel and oxidant) stream of the auxiliary igniter burner, and a deflector causes a small part of this gaseous stream to contact the igniter coil. The igniter coil thus remains substantially outside the auxiliary flame thereby avoiding subjecting it to the in-



tense heat of the full auxiliary flame. In operation, the coil is first energized to cause it to heat up, the auxiliary (igniter) burner is then supplied fuel, to cause the deflected part of the gaseous stream and therefore the whole stream to be ignited, which in turn lights the main device (e.g., sampling burner). The system may also be readily automated, so as to minimize manual operations by the user.

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**3,600,120**
**FLASHLAMP**
**Bernard Kopelman, Salem, Mass., assignor to Sylvania Electric Products Inc.**
**Filed Sept. 12, 1967, Ser. No. 667,195**
**Int. Cl. F21k *5/02***
**U.S. Cl. 431—93** **6 Claims**

A percussively triggered flashlamp is made of a light-transmitting envelope, such as glass, with a metal tube extending therefrom and holding the percussive material, and a loose fitting of a combustible material such as shredded zirconium, in an atmosphere of combustion-supporting gas, such as oxygen. The percussive material has particles of a metal such as zirconium mixed therewith to incandesce and ignite the zirconium shreds. The percussive material can be detonated by striking or squeezing the metal tube containing it, as with a firing pin. A wire can extend into the metal tube to act as an anvil against which the percussive material is forced by the firing pin, and can also serve as a means of fitting the tube with percussive material during manufacture of the lamp. The lamp can be used in a flashcube, preferably by modifying the base to insure the presence of a firm background behind the metal tube and against which the firing pin can force it especially if there is no wire or other anvil present in the tube. To facilitate miniaturization of the camera with which the flashlamp can be used, and to permit interchangeability of different size cubes, the metal tube can be offset from the axis of the envelope and the envelope positioned so the tube is set nearer to the axis of the flashcube.

# CHEMICAL

3,600,121
## METHOD FOR OBTAINING LEVEL DYEING ON CELLULOSIC FIBERS USING POLYETHYLENE GLYCOL CARBOXYLIC ACID ESTERS AS UNSTABLE RETARDING AGENT

Paul Feldmann, Danville, Va., assignor to
Dan River Inc., Danville, Va.

No Drawing. Filed Nov. 27, 1967, Ser. No. 696,961
Int. Cl. C09b *9/00*
U.S. Cl. 8—34 17 Claims

Dyeing methods employing polyethylene glycol carboxylic acid esters as unstable retarding agents in alkaline dyebaths containing vat or sulfur dyestuffs provide level dyeing and permit substantial exhaustion of dyebath and close control over the dyeing process.

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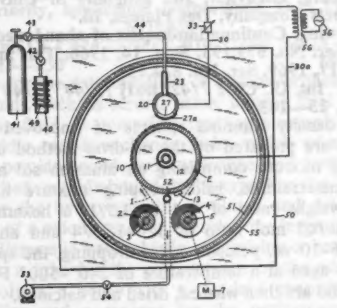
3,600,122
## METHOD OF GRAFTING ETHYLENICALLY UNSATURATED MONOMER TO A POLYMERIC SUBSTRATE

John H. Coleman, Old Westbury, N.Y., assignor to
Surface Aviation Corporation, Westbury, N.Y.

Filed July 1, 1966, Ser. No. 563,931
Int. Cl. D06m *9/00;* B44d *1/092, 1/52*
U.S. Cl. 8—115.7 12 Claims



1. The method of free radical initiation of a polymer graft to an organic polymeric substrate which comprises subjecting a substrate selected from the group consisting of polyolefins, polyesters, polyamides, and cellulosic and proteinaceous products to a spark discharge in a zone of free radical initiating gas selected from the group consisting of argon, hydrogen, helium, a mixture of argon and hydrogen, and a mixture of helium and hydrogen to generate free radical sites on the surface of said substrate, and subsequently exposing said substrate to an ethylenically unsaturated monomer.

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3,600,123
## MODIFICATION OF CELLULOSIC TEXTILE MATERIALS WITH FORMALDEHYDE AND CYANAMIDE USING AMMONIUM SALT CATALYSTS

Hugh J. E. Campbell, Clarkson, Ontario, Canada, assignor to Ontario Research Foundation, Toronto, Ontario, Canada

No Drawing. Filed Mar. 24, 1967, Ser. No. 625,602
Claims priority, application Great Britain, Mar. 30, 1966, 14,185/66, 14,186/66
Int. Cl. D06m *13/14, 13/36*
U.S. Cl. 8—116.3 8 Claims

A process for treating a cellulosic textile material to improve the dimensional stability and crease resistance thereof wherein formaldehyde and cyanamide are reacted at an elevated temperature in the presence of a catalyst and water, and in contact with the material is improved by employing as the catalyst, a salt selected from the group consisting of ammonium dihydrogen phosphate, diammonium hydrogen phosphate, triammonium phosphate, diammonium sulfate, diammonium sulfite, ammonium sulfamate, and mixtures thereof.

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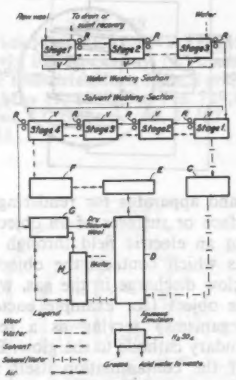
3,600,124
## WOOL SCOURING PROCESS

Raymond Arthur Couche, 168 Adelaide Terrace, Perth, Western Australia, Australia

Filed Aug. 8, 1968, Ser. No. 751,250
Int. Cl. D01c *3/00;* C11b *11/00*
U.S. Cl. 8—139.1 12 Claims



The invention relates to a process of scouring wool using a hydrophilic solvent or mixture of solvents after the raw wool has been first washed with water at a temperature below the temperature at which wool wax melts and preferably at or below ambient temperature. The solvent/water ratio in the solvent stage into which the water wet wool passes is controlled to ensure that substantially all the wool wax dissolved in the solvent remains in solution.

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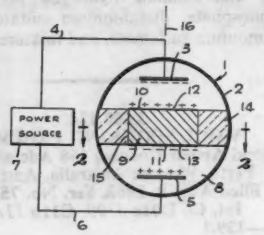
3,600,125
## METHOD OF UTILIZING PIPERIDINE AS A CONDENSATE CORROSION INHIBITOR

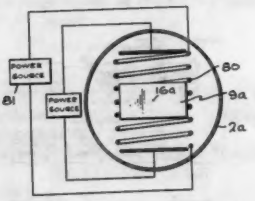
Kenneth G. Phillips, River Forest, Ill., assignor to Nalco Chemical Company, Chicago, Ill.

No Drawing. Filed May 16, 1969, Ser. No. 825,395
Int. Cl. C23f *11/04, 11/08*
U.S. Cl. 21—2.7 4 Claims

A method of and dosage concentration for inhibiting $CO_2$ and $O_2$ corrosion in boiler steam condensate systems comprising adding piperidine in condensate concentrations of from about 1.0 to 10.0 p.p.m. to achieve a pH of about 8.8 to 9.5 This method provides adequate protection especially for the ferrous metal pipes normally utilized in condensate systems and utilizes a reagent with a favorable distribution ratio between vapor and initially formed condensate.

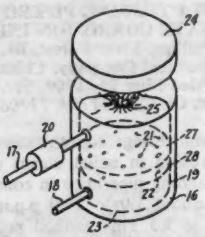
3,600,126
**ASEPSIS PROCESS AND APPARATUS**
Emil J. Hellund, 31281 Holly Drive, South Laguna, Calif. 92677
Continuation-in-part of abandoned application Ser. No. 533,767, Feb. 21, 1966. This application Feb. 5, 1968, Ser. No. 702,929
Int. Cl. A61l *1/00, 3/00*
U.S. Cl. 21—54 25 Claims




A process and apparatus for rendering aseptic a contaminated surface or surfaces of an object being treated, by establishing an electric field through the object and through a gas which contacts the object, in a relation producing a glow discharge in the gas, with the contamination on the object (for example bacteria, viruses or other microorganisms) serving as a secondary anode and/or a secondary cathode to the glow. By virtue of this functioning of the contamination itself as a secondary electrode to the glow, the contaminants are bombarded by electrons and/or ions which impact against and thereby kill or otherwise disable the contaminants. The impedance to by-passing of current past the object being treated is maintained high enough to force the contamination to serve its intended function as an anode or cathode to the glow.

3,600,127
**FLUIDIZED BED STERILIZING PROCESS**
Karl Kereluk, Fairview, and Robert S. Lloyd, Erie, Pa., assignors to American Sterilizer Company, Erie, Pa.
Filed Oct. 7, 1969, Ser. No. 864,312
Int. Cl. A61l *1/00*
U.S. Cl. 21—58 2 Claims



A method and apparatus for sterilizing powder in sealed bags comprising placing finely divided material, such as powder, sealed in semi-permeable bags in containers with a side having an inlet and outlet for gas. The bags have partitions and have openings which may register the gas inlets and outlets. The bags are specially designed of semi-permeable material which allows the gas to flow through the material and out the outlet of the container. The apparatus functions as a fluid bed and the powder in the bag becomes fluidized.

3,600,128
**PROCESS FOR IRON REMOVAL FROM ZINC CHLORIDE SOLUTIONS**
William A. Schulze, Cleveland, Ohio, assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.
No Drawing. Filed Feb. 18, 1969, Ser. No. 800,278
Int. Cl. C01g *9/04*
U.S. Cl. 23—97 4 Claims

This specification discloses a process for removing iron compounds from a zinc chloride solution containing dissolved therein small quantities of organic matter by first contacting the solution with activated carbon and thereafter adding an oxidizer to precipitate the iron out of solution. The activated carbon and iron solids are removed either by filtration or by other conventional techniques such as settling or centrifuging. The process improves the filtration rate.

3,600,129
**MANUFACTURE OF LOW BULK DENSITY HIGH STRENGTH SPHERICAL ALUMINA PARTICLES**
Kenneth D. Vesely, Arlington Heights, and Laurence R. Steenberg, Glenview, Ill., assignors to Universal Oil Products Company, Des Plaines, Ill.
No Drawing. Continuation-in-part of abandoned application Ser. No. 579,193, Sept. 14, 1966. This application June 17, 1969, Ser. No. 834,153
Int. Cl. C01f *7/42*; B01j *11/44, 11/40*
U.S. Cl. 23—143 4 Claims

Low density alumina spheres of improved crushing strength are prepared by the oil-drop method utilizing a dropping mixture comprising an alumina sol and hexamethylenetetramine, said dropping mixture having an Al/Cl weight ratio of 1:1 to 1.5:1, a hexamethylenetetramine/Cl mol ratio of 1/4–1.25/4 and an Al content of 6–10 wt. percent. After dropping, the spheres are pressure aged at a temperature of 240°–500° F. for 1–5 hours, and are then washed, dried and calcined.

3,600,130
**DESULFURIZATION OF FLUID PETROLEUM COKE**
Clyde L. Aldridge and Robert H. Waghorne, Baton Rouge, La., assignors to Esso Research and Engineering Company
No Drawing. Filed Mar. 24, 1969, Ser. No. 809,937
Int. Cl. C01b *31/02*
U.S. Cl. 23—209.9 4 Claims

A method for removing metals and sulfur from petroleum coke by partial gasification of the coke with steam at elevated pressures and temperatures. Gasification of less than approximately fifty percent of the coke with steam at pressures ranging from about 100 to 3,000 p.s.i.g. results in selective desulfurization of the unconverted coke. Temperatures range from about 800 up to about 2500° F. The extent of gasification ranges from about 5 to 50% of the coke.

3,600,131
**REMOVAL OF SULFUR DIOXIDE FROM WASTE GASES**
Indravadan S. Shah, Forest Hills, N.Y., assignor to Chemical Construction Corporation, New York, N.Y.
Filed Jan. 27, 1969, Ser. No. 794,200
Int. Cl. C01b *17/00, 17/48*
U.S. Cl. 23—224 2 Claims

A process is provided to efficiently and economically absorb and recover the sulfur dioxide content of waste

gas streams, and thus eliminate air pollution and produce a useful sulfur-containing product. Sulfur dioxide is recovered from a waste gas stream, such as the flue gas from a steam power boiler which burns a sulfur-containing fuel such as coal, by scrubbing the waste gas stream with an aqueous solution containing sodium sulfite and sodium bisulfite. Sulfur dioxide is absorbed into the aqueous scrubbing solution and reacts with sodium sulfite to form further sodium bisulfite in aqueous solution. The resulting solution is divided into a first portion and a second portion. Magnesium oxide or hydroxide is added to the first portion to convert sodium bisulfite to sodium sulfite and precipitate solid magnesium sulfite, which is filtered or otherwise separated from the solution and processed to recover a valuable sulfur-containing product, such as by calcining to produce a gas stream rich in sulfur dioxide or elements sulfur vapor, or by oxidizing to magnesium sulfate product. The residual solution is combined with the second scrubbing solution portion, and the combined solution is recycled for further waste gas scrubbing.

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**3,600,132**

**PROCESS FOR THE DETERMINATION OF THE HYDROXYPROLINE CONTENT OF BIOLOGICAL FLUIDS, AND DIAGNOSTIC PACKS FOR THIS DETERMINATION**

**Bastiaan Cornelis Goverde, Oss, Netherlands, assignor to Organon Inc., West Orange, N.J.**

**No Drawing. Filed Dec. 4, 1968, Ser. No. 781,243**
**Claims priority, application Netherlands, Dec. 11, 1967, 6716836**
**Int. Cl. C07d** *27/00;* **G01n** *31/04, 33/16*
**U.S. Cl. 23—230** **10 Claims**

Process for the determination of hydroxyproline in biological fluids, such as serum, urine, lumbar fluid and interarticular fluid. It comprises treating a sample with a strong acidic cation exchange resin, which adsorbs the free and peptide-bound hydroxyproline and hydrolyzing the adsorbed peptide-bound hydroxyproline by heating, whereafter the hydroxyproline is eluted and determined by means of a colour reaction. Besides, the invention comprises a diagnostic pack chiefly comprising a bottle with said resin, a tube for the performance of the adsorption and hydrolysis, a bottle with a standard quantity of hydroxyproline and a reagent for the performance of a colour reaction. In this way tracing of deviations in collagen metabolism can easily be performed.

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**3,600,133**

**METHOD FOR DETERMINING THE STRENGTH OF EMULSIONS**

**Gareth G. Price, Bernard Wheelahan, and Simon D. E. Stafford-Gaffney, Melbourne, Victoria, Australia, assignors to Shell Oil Company, New York, N.Y.**

**No Drawing. Filed Apr. 17, 1969, Ser. No. 817,146**
**Claims priority, application Australia, Apr. 22, 1968, 36,696/68**
**Int. Cl. C09k** *3/00;* **G01n** *31/22, 33/26*
**U.S. Cl. 23—230** **11 Claims**

A method for determining the emulsion strength of an aqueous emulsion using a novel marking agent and indicator and comparing it against a standard emulsion.

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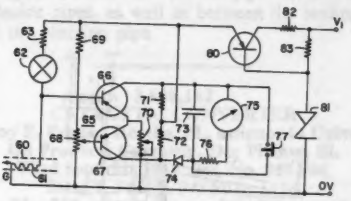
**3,600,134**

**METHOD FOR THE DETERMINATION OF ALCOHOL AND OTHER OXIDIZABLE ORGANIC COMPOUNDS IN RESPIRED AIR AND BODY FLUIDS**

**Hans Gunter Nöller, Raleigh, N.C., assignor to Corning Glass Works, Corning, N.Y.**

**Filed Apr. 11, 1968, Ser. No. 720,736**
**Int. Cl. G01n** *25/22*
**U.S. Cl. 23—232E** **23 Claims**

A method and apparatus for determining oxidizable organic compounds in human and animal body gases and fluids. Gases to be tested are introduced, together with excess oxygen, into a vessel containing a heated metal catalyst. The resulting changes in electro-physical values of



the catalyst, e.g., temperature and resistance, which are dependent on the concentration of oxidizable compounds contained in the gas, are measured to provide an indication of the concentration of the oxidizable compounds.

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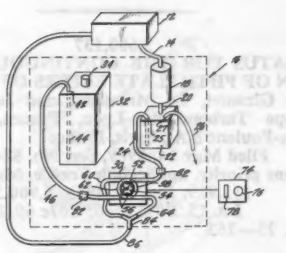
**3,600,135**

**APPARATUS FOR REAGENT FORMATION**

**Robert Davis, Far Rockaway, N.Y., assignor to Scientific Industries, Inc., New York, N.Y.**

**Filed May 16, 1968, Ser. No. 729,814**
**Int. Cl. G01n** *31/00, 31/02*
**U.S. Cl. 23—253** **3 Claims**



Reagent for use in an apparatus is formed from concentrated reagent mixed with an additional reagent component, e.g. a diluting medium, such as deionized and demineralized water; the newly formed reagent passes through an apparatus that uses and alters the reagent; the liquid from the apparatus passes through a treatment cartridge where certain components are removed and/or others are added, e.g. a deionizing and demineralizing cartridge where the ions and minerals are removed from the spent and altered reagent creating deionized and demineralized water; this treated liquid is newly reformed additional reagent component which is again mixed with concentrated reagent to form new reagent.

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**3,600,136**

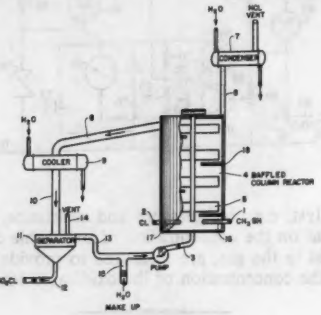
**APPARATUS FOR PRODUCING METHANE SULFONYL CHLORIDE**

**Silvio L. Giolito, Whitestone, and Harry O. Hofmann, Yonkers, N.Y., assignors to Stauffer Chemical Company, New York, N.Y.**

**Original application Jan. 3, 1966, Ser. No. 518,199. Divided and this application Aug. 26, 1968, Ser. No. 777,527**
**Int. Cl. B01j** *1/00;* **C07** *9/00*
**U.S. Cl. 23—260** **1 Claim**

Apparatus for conducting a continuous chemical reaction comprising in combination: (A) a vertically dis-

posed baffled column reactor; (B) a cooler; (C) a separator; (D) a vented condenser; and (E) conduit means for feeding and dispersing reactants into the column reactor at a position near the bottom. The baffled column reactor, cooler and separator are connected by conduit




means to provide flow of the reaction matrix from the top of the column reactor first to the cooler, then to the separator and finally the lighter phase from the separator to the bottom of the column reactor. The condenser being mounted at an elevated position above the column reactor for gravity recycle of condensed liquids.

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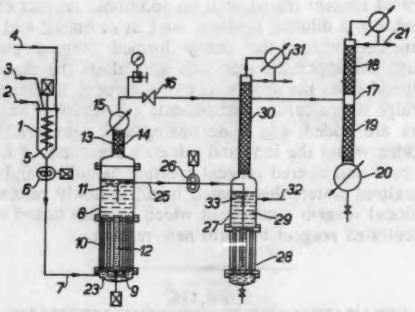
**3,600,137**

**APPARATUS FOR THE CONTINUOUS PREPARATION OF PHTHALATE ESTERS OF GLYCOLS**

**Antoine Girantet, La Mulatiere, and Jean Roget and Philippe Tarbouriech, Lyon, France, assignors to Rhone-Poulenc S.A., Paris, France**

**Filed May 14, 1969, Ser. No. 824,585**
**Claims priority, application France, May 15, 1968, 151,929, Jan. 10, 1969, 6,900,301**
**Int. Cl. B01j *1/00*; C07c *69/82***
**U.S. Cl. 23—263** **5 Claims**



Apparatus for the continuous esterification of glycols with phthalic acids comprising two reactors in series, 65 to 88% of the esterification being completed in the first reactor and the remainder in the second, each reactor providing for intimate mixing of the reactants and removal of volatile products. The reactors contain a plurality of reaction zones with at least one vertical tube bundle having at least one vertical pipeline associated therewith located in each reactor, the former providing vapor risers and the latter providing liquid downcomers, thereby facilitating intimate mixing and circulation of the phases within the reactors.

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**3,600,138**

**CRYSTALLIZER**

**Robert R. Voigt, Warren, Pa., assignor to Struthers Scientific and International Corporation**

**Filed Aug. 11, 1967, Ser. No. 659,953**
**Claims priority, application Great Britain, Aug. 23, 1966, 37,701/66**
**Int. Cl. B01d *9/02***
**U.S. Cl. 23—273** **1 Claim**

A vacuum evaporator within a single shell having a downwardly extending cone within the shell and having a tail pipe extending downward from the cone, and means within the tail pipe circulating a mother liquor downward in said tail pipe to flow upward about the cone, the upper chamber being a vacuum evaporating chamber and the lower chamber being a crystallization chamber.

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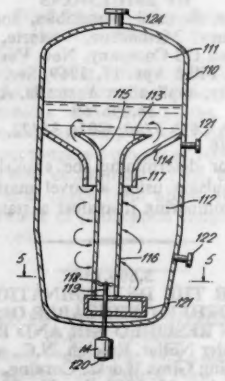
**3,600,139**

**CRYSTALLIZATION APPARATUS**

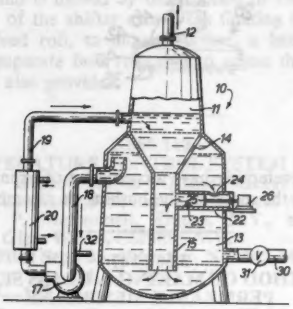
**Robert H. Hedrick, Warren, Pa., assignor to Struthers Scientific and International Corporation**

**Filed Aug. 14, 1967, Ser. No. 660,425**
**Claims priority, application Great Britain, Aug. 23, 1966, 37,650/66, 37,702/66**
**Int. Cl. B01d *9/02***
**U.S. Cl. 23—273** **1 Claim**



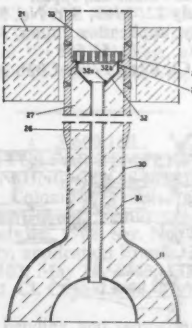
Crystals are grown in a rotating solution to increase the acceleration to which they are subjected and increase the growth rate of the crystals.

3,600,140
FLOW CRYSTALLIZER
Robert H. Hedrick, Warren, Pa., assignor to Struthers Scientific and International Corporation
Filed June 11, 1968, Ser. No. 736,224
Claims priority, application Great Britain, July 27, 1967, 34,607/67
Int. Cl. B01d 9/02
U.S. Cl. 23—273 1 Claim



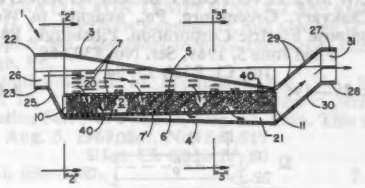
In a crystallizer having a first recirculating loop between a vacuum evaporation chamber and a suspension chamber, there is added a second recirculation loop recirculating mother liquor in the lower portion of the suspension chamber to increase the upward velocity of fluid in the lower portion of the suspension chamber.

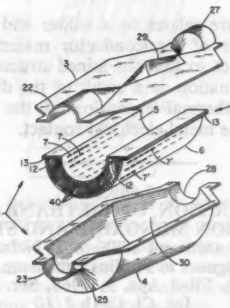
3,600,141
TUBE FURNACE FOR RECOVERY OF SYNTHESIS GASES FROM HYDROCARBON CRACKING
Paul Mevenkamp, Lichtendorf, and Hans-Dieter Marsch, Dortmund, Germany, assignors to Friedrich Uhde G.m.b.H., Dortmund, Germany
Filed Dec. 2, 1968, Ser. No. 780,539
Claims priority, application Germany, Dec. 4, 1967, P 16 67 324.8
Int. Cl. B01j 9/04
U.S. Cl. 23—288 4 Claims



A tube furnace for the recovery of synthesis gases from hydrocarbon cracking in which a reaction pipe extends through the furnace floor and is solely supported at its lower end beneath such floor by a collector pipe to which it is connected by a welded joint which can be broken for repairing the reaction pipe. Centrally of the reaction pipe is a central pipe leading from the collector to the furnace floor. A sealing member is rigidly connected respectively to the upper end of the central pipe and the reaction pipe preventing reaction gases from passing to the space between the central and reaction pipes. Thermal insulation fills the space between the central pipe and the reaction and collector pipes, as well as between the sealing member and the reaction pipe.

3,600,142
CATALYTIC CONVERTER
Le Roy E. Fessler, Roselle, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.
Filed Sept. 22, 1969, Ser. No. 859,906
Int. Cl. B01j 9/04; F01n 3/14
U.S. Cl. 23—280 8 Claims



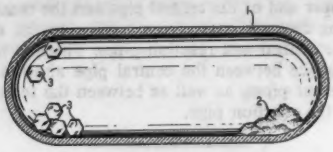


A catalytic converter for treating an engine exhaust stream which embodies a segment-cylinder-form catalyst retaining section supported by the outer housing in a slideable manner. In a preferred embodiment there is provided maximum catalyst volume with minimum inlet area. Also, in a preferred arrangement, the converter has a catalyst reservoir therein which serves as a storage for fresh catalyst particles that flow into the catalyst retaining section, replacing catalyst particles lost by attrition.

3,600,143
GROWTH OF CRYSTALLINE CHALCOGENIDE SPINELS
Friedel H. P. Wehmeier, Murray Hill, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill and Berkeley Heights, N.J.
Filed Sept. 30, 1968, Ser. No. 763,626
Int. Cl. B01d 5/00
U.S. Cl. 23—294 6 Claims

Crystalline chalcogenide spinels, such as $CdCr_2Se_4$, are grown by a vapor transport process using the spinel as a solid source. Growth at temperatures above the decompo-

sition temperature of the spinel is expedited by an overpressure of selenium produced by the use of elemental selenium as an initial ingredient. Both closed and open tube procedures are described.



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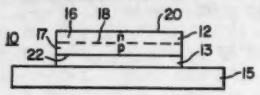
**3,600,144**
**LOW MELTING POINT BRAZING ALLOY**
**Tibor Csakvary, Greensburg, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.**
**Filed June 5, 1969, Ser. No. 830,669**
**Int. Cl. B32b** *15/04*
**U.S. Cl. 29—195** **4 Claims**



This disclosure relates to a solder and a method for joining a wafer of semiconductor material to a metal electrical contact so that the joined structure has a minimum of deformation as a result of the difference in the coefficient of thermal expansion of the semiconductor material and the metal electrical contact.

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**3,600,145**
**PRODUCTION OF METHANE FROM CARBON MONOXIDE AND STEAM**
**Marvin M. Johnson and William T. Nelson, Bartlesville, Okla., assignors to Phillips Petroleum Company**
**No Drawing. Filed Apr. 9, 1968, Ser. No. 719,849**
**Int. Cl. C01b** *2/10*
**U.S. Cl. 48—197** **5 Claims**

Carbon monoxide and steam are converted practically quantitatively to methane and carbon dioxide at a temperature of 400–2000° F., a pressure in the range of 0 to 1,000 pounds per square inch gage, gaseous hourly space rates for CO of 200–10,000 and at carbon monoxide to steam ratio (in moles) of from about 0.2 to about 20 over a nickel catalyst promoted with a barium salt of an organic acid, e.g., barium acetate, the catalyst being supported on an alumina-containing support material, e.g., alumina or calcium aluminate.

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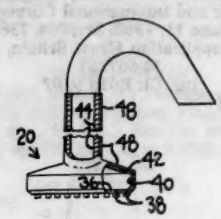
**3,600,146**
**GLASS BUSHING WITH HIGH EMISSIVITY COATING**
**Thomas H. Jensen, Murrysville, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.**
**Filed July 23, 1968, Ser. No. 746,800**
**Int. Cl. C03k** *37/08*
**U.S. Cl. 65—11** **3 Claims**

Platinum and platinum alloys such as those used for bushings and bushing assemblies in the manufacture of glass fibers have relatively low emissivity values. In some processes parts of such bushings or assemblies are exposed to radiant energy and to increase radiant heat exchange, a coating of a material having a relatively high emissivity is applied to at least those parts of the bushing or assembly so exposed. Such coatings are continuous throughout their extent and preferably have a coefficient of expansion compatible with the metal of the bushing or assembly.



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**3,600,147**
**METHOD OF MAKING A GLASS SEMI-PERMEABLE MEMBRANE**
**Charles L. McKinnis, 9 Mount Parnassus Drive, and Charles I. Cohen, Rte. 2, Chelsea Road, both of Granville, Ohio 43023**
**Continuation of application Ser. No. 726,297, May 3, 1968. This application Jan. 2, 1970, Ser. No. 492**
**Int. Cl. C03c** *15/00;* **B01d** *31/00*
**U.S. Cl. 65—31** **10 Claims**

A process of making a semipermeable membrane that includes leaching an inorganic glass film.

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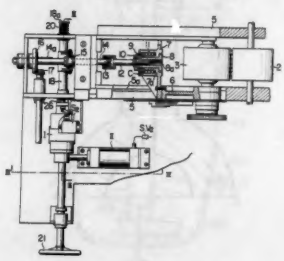
**3,600,148**
**SAFETY DEVICES FOR FEED ROLLS OF GLASS BULB BLOWING APPARATUS**
**Junji Yamada, Odawara-shi, and Makoto Wada, Kawasaki-shi, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha (also known as Tokyo Shibaura Electric Co., Ltd.), Kawasaki-shi, Japan**
**Filed July 22, 1969, Ser. No. 843,392**
**Claims priority, application Japan, July 23, 1968, 43/51,580**
**Int. Cl. F16p** *7/00;* **C03b** *9/13*
**U.S. Cl. 65—159** **4 Claims**



In a ribbon type glass bulb blowing apparatus, a safety device is provided for a pair of feed rolls adapted to form a stream of molten glass, into a glass ribbon and to

separate feed rolls from each other in response to the presence of solid contaminants in the stream of molten glass. One of the feed rolls is supported on a floating bracket which is connected through a coupling to a shifter. The bracket responds to a contaminant in the molten glass and actuates a piston-cylinder which unlocks a locking device. The unlocking actuates another piston-cylinder which rotates a shaft. The shifter is carried by the shaft and is moved by the rotation of the shaft. The movement of the shifter causes the floating bracket, and thus the feed roll, to move. Further, a hand wheel to manually separate feed rolls and to adjust the nip therebetween is also provided.

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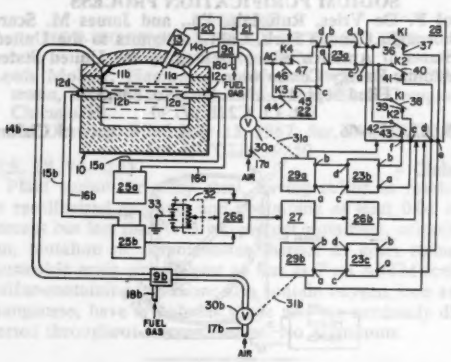
**3,600,149**
**TEMPERATURE CONTROL SYSTEM FOR A GLASS TANK FOREHEARTH**

**Tai-Seng Chen, Lafayette, Ind., and Kenneth A. Cook and Bernard P. McDonnell, Elmira, N.Y., assignors to Corning Glass Works, Corning, N.Y.**

**Filed Sept. 26, 1969, Ser. No. 861,246**
**Int. Cl. G12b *1/00***
**U.S. Cl. 65—162** **12 Claims**



A system for controlling the temperature of a bath or pool of molten glass in a forehearth so that the temperatures of such glass at first and second opposite sides of the forehearth are equal or differ from each other by a preselected amount. Such system may be employed in conjunction with prior known systems for maintaining the temperature of the molten glass, at a selected point between said sides of the forehearth, at a preselected temperature.

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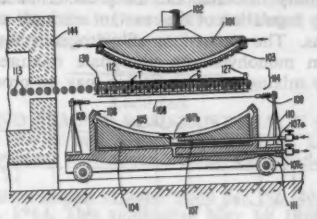
**3,600,150**
**APPARATUS FOR TEMPERING AND BENDING GLASS SHEETS**

**André Rougeux, Colombes, France, assignor to Compagnie de Saint-Gobain, Neuilly-sur-Seine, France**

**Filed July 10, 1968, Ser. No. 743,696**
**Claims priority, application France, July 13, 1967, 114,203; May 10, 1968, 151,472**
**Int. Cl. C03b *23/02, 27/00***
**U.S. Cl. 65—268** **11 Claims**

Apparatus for bending and tempering glass sheets by contact with two refrigerated forms, one of which is rigid and the other of which is flexible. The flexible form comprises a flexible fabric membrane which is sealed to a fixed rim to form an enclosed pressure chamber. Conduits circulate a cooling fluid which contacts the faces of both forms and which applies pressure to the membrane. A sling of flexible refractory fibers supports the glass sheets between the forms when the forms are disposed in a vertical plane. When the forms are disposed in a horizontal plane, a flexible fabric hammock supports the glass between them. A split carriage having two



sections moves the glass sheet and lays it upon the hammock by separation of the two sections.

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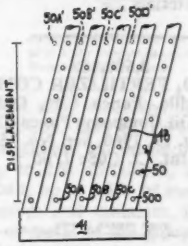
**3,600,151**
**APPARATUS FOR TEMPERING GLASS SHEETS**

**James H. Cypher, New Kensington, and George W. Stilley, Freeport, Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.**

**Continuation-in-part of application Ser. No. 806,803, Mar. 13, 1969, which is a continuation-in-part of application Ser. No. 572,043, Aug. 12, 1966. This application Aug. 5, 1969, Ser. No. 847,617**
**Int. Cl. C03b *27/00***
**U.S. Cl. 65—348** **7 Claims**



Tempering a heated glass sheet by imparting a pattern of moving blasts of tempering medium, such as air, against the major surfaces of the hot glass sheet from a pair of sets of spaced parallel pipes each having substantially equi-distant apertures. All of the apertures are arranged in rows extending at an oblique angle to the axis of linear reciprocation of relative movement between the glass and the apertures and in rows approximately normal to said axis. The pipes are reciprocated in unison along an axis of reciprocation to provide an amplitude of reciprocation so related to the aperture spacing and said orientation of the oblique lines of apertures that each aperture occupying a first position at one end of its reciprocation path is displaced to a second position between corresponding first positions occupied by other apertures from the oblique lines of apertures and from the transverse rows of apertures. This arrangement provides a substantially equal application of tempering medium to each increment of glass sheet surface.

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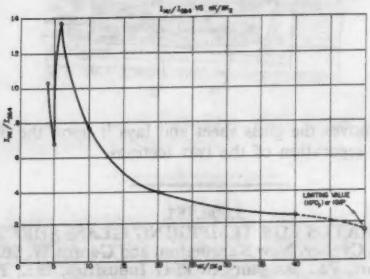
**3,600,152**
**PHOSPHATE FERTILIZER PRODUCTS**

**Erhart K. Drechsel, Tucson, Ariz., and John B. Sardisco, Shreveport, La., assignors to Pennzoil United, Inc., Shreveport, La.**

**Filed Aug. 27, 1968, Ser. No. 755,699**
**Int. Cl. C05b *7/00***
**U.S. Cl. 71—34** **10 Claims**

Fertilizer products having controlled water solubilities and molecular weights which comprise polymeric reaction products of potassium dihydrogen phosphate and potassium monohydrogen phosphate having molecular weights

of about 20,000 to 80,000, produced in the temperature range of 250 to 850° C. The products are unique in that the solubility in water can be predetermined and controlled by regulation of the reactant amounts and reaction conditions. The potassium dihydrogen phosphate and potassium monohydrogen phosphate mixtures are produced by mixing or the mixtures may be produced by a



reaction of phosphate rock and/or derivatives thereof with phosphoric acid or mixtures thereof with sulfuric acid and potassium bisulfate and/or potassium sulfate. There is also disclosed a potassium polyphosphate designated potassium anhydrophosphate of varying water solubility and molecular weight. These product mixtures exhibit excellent solubility properties for use as controlled-release fertilizer materials.

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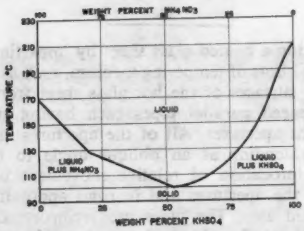
**3,600,153**

**$NH_4NO_3$-$KHSO_4$ FERTILIZER COMPOSITION**

**James F. Rounsaville, Ponca City, Okla., assignor to Continental Oil Company, Ponca City, Okla.**

**Filed Aug. 19, 1968, Ser. No. 753,349**
**Int. Cl. C05c** *1/00*
**U.S. Cl. 71—59** **3 Claims**




Melt fertilizer comprising potassium bisulfate and ammonium nitrate is prepared by acidulating KCl or $K_2SO_4$, removing by-product HCl if formed, admixing the resulting potassium bisulfate with ammonium nitrate in the molten state to obtain a eutectic mixture of $NH_4NO_3$ and $KHSO_4$, which is cooled to the solid product. While in the molten state, the eutectic mixture may be ammoniated and/or granulated. Likewise other salts may be added to the molten mixture prior to its solidifying.

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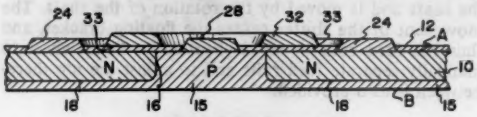
**3,600,154**

**PROCESS FOR THE CONTINUOUS PREPARATION OF NITROPHOSPHATE FERTILIZERS**

**Willem Slot, Heerlen, and Johan D. Logemann, Geleen, Netherlands, assignors to Stamicarbon N.V., Heerlen, Netherlands**

**Filed Feb. 28, 1969, Ser. No. 803,261**
**Claims priority, application Netherlands, Feb. 29, 1968, 6802841**
**Int. Cl. C05b** *11/06*
**U.S. Cl. 71—35** **3 Claims**

An improved process for the continuous preparation of a nitrophosphate fertilizer wherein phosphate rock is decomposed in an aqueous solution containing sufficient nitric acid to dissolve the phosphate rock, sulphuric acid is then added to the solution in a sufficient amount to precipitate gypsum with the simultaneous reformation of nitric acid, additional phosphate rock is then added to the solution and dissolved by the reformed nitric acid, ammonium sulphate is then added to




the solution to react with the dissolved calcium ions obtained in dissolving the additional phosphate rock, thereby precipitating additional gypsum, the precipitated gypsum is then separated from the solution, and the gysum-free solution is then neutralized with ammonia and evaporated to dryness to form a solid fertilizer composition.

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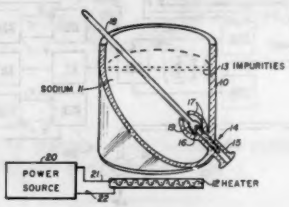
**3,600,155**

**SODIUM PURIFICATION PROCESS**

**Paul F. De Vries, Ruffsdale, Pa., and James M. Scarborough, Canoga Park, Calif., assignors to the United States of America as represented by the United States Atomic Energy Commission**

**Filed Sept. 16, 1969, Ser. No. 858,338**
**Int. Cl. C22b** *27/00*
**U.S. Cl. 75—66** **5 Claims**




A process for the purification of sodium wherein sodium is heated or cooled to a temperature just above its melting point such that impurities, such as sodium oxide, which are very nearly insoluble in sodium at this temperature, rise to the surface of the pool of sodium, whereafter the sodium below the surface, which is essentially free of impurities, is removed. This process is applicable for producing purified sodium for general use, but is particularly effective in a continuous operation as reqiured in circulating systems such as nuclear reactors, heat exchangers, research loops, etc. where continuous removal of impurities is required.

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**3,600,156**

**RECOVERY OF MERCURY FROM CINNABAR**

**Jefferson M. Clapton, Denver, Colo., and Donald K. McCready, Riverton, Wyoming, assignors to Jefferson M. Clapton, Denver, Colo., and Donald K. McCready, Riverton, Wyoming, jointly**

**Filed Aug. 9, 1968, Ser. No. 751,427**
**Int. Cl. C32b** *43/00*
**U.S. Cl. 75—101** **10 Claims**

The production of mercury from an ore containing cinnabar. The first portion consists in comminuting the ore and leaching the ore and by dissolving the cinnabar in a sodium sulphide solution in the presence of an hydroxyl ion, provided by calcium hydroxide. The pregnant solution subsequently obtained is removed from the ore and is thereafter treated by passing the same through one or more towers containing vertically disposed arrays of strands of aluminum wire, or other elongated structural

forms. The formation of hydrogen by reaction of the hydroxyl ion with aluminum and the reduction of the mercury to its metallic form, occurs with the mercury adhering to the vertical strands of wire to migrate downwardly therealong. A mercury, sufficiently pure as to require no further treatment will fall from the bottom ends of the strands as drops of substantial size. It was found that aluminum suitable for this purpose had to have less than 4 percent impurities to insure that the mercury will adhere.

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3,600,157

## RARE EARTH ADDITIONS TO URANIUM AND URANIUM ALLOYS

George E. Jaynes, Los Alamos, N. Mex., assignor to the United States of America as represented by the United States Atomic Energy Commission

No Drawing. Filed May 7, 1969, Ser. No. 822,695
Int. Cl. C22c *27/00*
U.S. Cl. 75—122.7 5 Claims

Yttrium or lanthanide rare earth metals are added to uranium and uranium alloys in the range of 0.1 to 0.3 weight percent. Nickel, cobalt, and rhodium are used as carrier metals for the rare earths.

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3,600,158

## HOT-WORKABLE STEEL WITH SULFUR AND VANADIUM

Louis Molnar, Hammond, Ind., and William E. Heitmann, Dolton, Ill., assignors to Inland Steel Company, Chicago, Ill.

No Drawing. Filed July 13, 1967, Ser. No. 653,039
Int. Cl. C22c *39/50*
U.S. Cl. 75—123 4 Claims

Plain carbon or alloy steel, having sulfur in residual or resulfurized amounts and containing at least 0.01 wt. percent but less than 0.03 wt. percent vanadium, columbium, tantalum or combinations thereof as grain refiner. Austenitic grain size at least as fine as 7 on ASTM scale. Sulfur-containing inclusions also contain oxygen, iron and manganese, have a globular shape and are randomly dispersed throughout microstructure. No aluminum.

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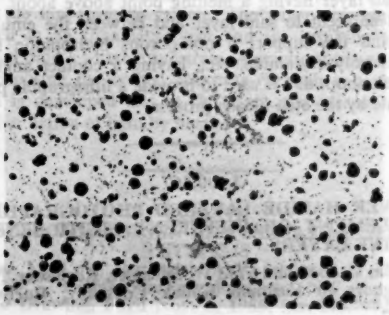
3,600,159

## NODULAR CAST IRON CONTAINING SILICON AND VANADIUM

William H. Moore, Meadow Lane, Purchase, N.Y. 10577, and Walter E. Gruver, Jr., 7 Sundance Drive, Cos Cob, Conn. 06807

Filed Mar. 11, 1968, Ser. No. 712,188
Int. Cl. C22c *37/00, 39/00*
U.S. Cl. 75—123 2 Claims



An improved cast iron particularly adapted for use in articles occupying a high temperature environment and comprising about 3.50% to 5.00% silicon; about 0.70% to 2.00% vanadium; and about 2.80% to 3.80% carbon; the graphite is in the nodular form and the excess carbides are in the form of randomly distributed, generally cubical shapes, in a pearlitic matrix.

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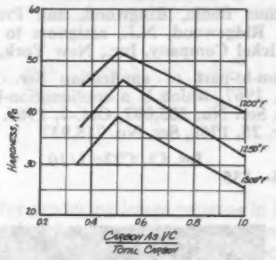
3,600,160

## HEAT AND TEMPER RESISTANT ALLOY STEEL

Charles R. Simcoe and Alvin E. Nehrenberg, Lockport, N.Y., assignors to Wallace-Murray Corporation, New York, N.Y.

Continuation-in-part of application Ser. No. 402,295, Oct. 7, 1964. This application May 14, 1968, Ser. No. 729,096
Int. Cl. C22c *39/00, 39/121*
U.S. Cl. 75—123J 3 Claims




HARDNESS AS A FUNCTION OF THE AMOUNT OF V IN THE CARBIDE PHASE, AT INDICATED TEMPERING TEMPERATURES.

Temper resistant alloy consisting essentially of about: 0.15 to 0.35% carbon, 0.25 to 1.0% vanadium, up to 2% each of manganese, silicon and nickel, up to 3% molybdenum, up to 2% chromium, up to 6% each of tungsten and cobalt, up to 0.5% of metal of the group of columbium, titanium and tantalum, said alloy containing at least 1% of metal of the group molybdenum and tungsten, and the vanadium content being about 1.8 to 3.0 times the carbon content, balance substantially iron.

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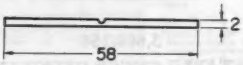
3,600,161

## LOW-ALLOYED HIGH STRENGTH STEEL HAVING RESISTANCE TO THE SULFIDE CORROSION CRACKING

Katsuya Inouye, Hideya Okada, and Yuzo Hosoi, Tokyo, and Kenichi Yukawa, Kawasaki, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed July 5, 1966, Ser. No. 562,870
Claims priority, application Japan, July 9, 1965, 40/41,118
Int. Cl. C22c *39/14*
U.S. Cl. 75—126F 1 Claim




A low-alloyed high strength steel having a low susceptibility to sulfide corrosion cracking containing

| | Percent |
|---|---|
| C | 0.10–0.20 |
| Si | 0.10–0.50 |
| Mn | 0.20–1.00 |
| Cr | 0.50–2.00 |
| Mo, less than | 0.60 |
| V, Ti or Cb, less than | 0.10 |
| Al, less than | 0.15 |
| Either W and/or Ta, | 0.02–1.00 |

and the balance being Fe and impurities.

3,600,162

## COBALT IRON MAGNETIC ALLOYS

Asa Kaplan, Ballston Lake, and Robert F. Gill, Schenectady, N.Y., assignors to General Electric Company

No Drawing. Filed Aug. 29, 1968, Ser. No. 756,308

Int. Cl. C22c *39/14*

U.S. Cl. 75—126C 6 Claims

The strength of cobalt-iron magnetic alloys is improved by the presence of secondary phase particles with retention of good magnetic properties.

3,600,163

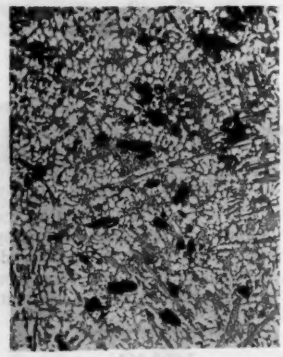
## PROCESS FOR PRODUCING AT LEAST ONE CONSTITUENT DISPERSED IN A METAL

Frank Arthur Badia, Ringwood, and Pradeep Kumar Rohatgi, Ridgewood, N.J., assignors to The International Nickel Company, Inc., New York, N.Y.

Continuation-in-part of application Ser. No. 644,429, May 25, 1967, which is a continuation-in-part of application Ser. No. 585,097, Oct. 7, 1966. This application Mar. 25, 1968, Ser. No. 715,937

Int. Cl. C22c *1/10*

U.S. Cl. 75—135 33 Claims



Alloys containing at least one constituent dispersed in metal in which the constituent is normally insoluble or incompatible when the metal is in the molten state (e.g., graphite in aluminum), are produced utilizing melt processing in which the constituent in particulate form and having a coating, particularly metal, is injected into a molten bath of incompatible metal and the melt is thereafter solidified.

3,600,164

## HEAT TREATABLE CREEP RESISTANT SOLDER

Douglas J. Harvey, Utica, Mich., assignor to General Motors Corporation, Detroit, Mich.

No Drawing. Filed Apr. 16, 1968, Ser. No. 721,597

Int. Cl. C22c *11/00*

U.S. Cl. 75—166C 2 Claims

A creep resistant, lead-based solder particularly useful in fabricating automobile radiators is disclosed. In a preferred embodiment, the solder comprises 2.5–5% tin, 10–20% bismuth and balance lead. Solder of this composition will withstand a stress of 400 p.s.i. at 220° F. for 50 hours or more and can be heat treated to withstand even higher stresses under the same conditions.

3,600,165

## OPTICAL SENSITISATION OF INORGANIC PHOTOCONDUCTORS

Jozef Frans Willems and Albert Lucien Poot, Wilrijk-Antwerp, and Robert Joseph Noe, Mortsel-Antwerp, Belgium, assignors to Gevaert-Agfa N.V., Mortsel, Belgium

No Drawing. Continuation of application Ser. No. 542,753, Apr. 14, 1966. This application Dec. 30, 1969, Ser. No. 888,131

Claims priority, application Great Britain, Apr. 15, 1965, 16,336/65

Int. Cl. G03g *5/08*

U.S. Cl. 96—1.7 6 Claims

An improved photoconductive material for use in photoconductive recording elements is obtained by treating a conventional inorganic metallic photoconductive compound with a small amount of an organic chelating agent which is adapted to form with the metallic ions of the photoconductive compound a colored chelate of increased light-sensitivity relative to the untreated photoconductive compound. A preferred amount of the chelating compound is 0.001–0.5% by weight of the photoconductive compound. A variety of suitable organic chelating agents are disclosed.

3,600,166

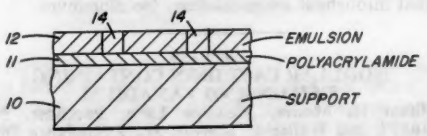
## LITHOGRAPHIC PLATE AND PROCESS OF MAKING

Albert L. Sieg and Robert N. Woodward, Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed July 3, 1967, Ser. No. 650,864

Int. Cl. G03f *7/02*

U.S. Cl. 96—36.3 17 Claims




A photographic element comprising a support such as paper, aluminum, etc., a gelatin photographic silver halide emulsion layer having a melting point above about 180° F. and adjacent to said layer and between the emulsion layer and the support a non-porous hydrophilic layer such as polyacrylamide, etc., having a contact angle of less than about 65° is used to provide a lithographic printing plate by the etch-bleach process.

3,600,167

## SILVER HALIDE LAYERED PHOTOGRAPHIC ELEMENT OF DIFFERENT LIGHT SENSITIVE LAYERS

Malcolm L. Judd and Fred W. Spangler, Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Filed Nov. 4, 1968, Ser. No. 773,328

Int. Cl. G03c *1/76*

U.S. Cl. 96—67 16 Claims

This invention relates to a process for producing a photographic element comprising coating a silver halide

layer with a pAg of below about 8.6 and coating adjacent said layer a layer comprising a water-soluble halide containing sufficient halide ions such that the pAg of the final emulsion layers of the element is within the range of about 9.0 to 10.0. In one aspect, this invention relates to a means for coating a blended, fine grain, direct-positive emulsion to achieve improved photographic properties.

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**3,600,168**
**LIGHT SENSITIVE REPRODUCTION SHEET AND METHOD AND COATING COMPOSITION THEREFOR USING FREE RADICALS**
William R. Lawton, Salem, N.H., assignor to Bard Laboratories, Inc., Amherst, N.H.
No Drawing. Filed Nov. 15, 1966, Ser. No. 594,375
Int. Cl. G03g *5/02*
U.S. Cl. 96—89 27 Claims

Light sensitive copy sheet employing a light sensitive composition comprising an organic colored stable free radical and a precursor sensitive to light to be converted to transient free radicals reactive with the stable free radical to bleach out the color thereof and thereby form an image.

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**3,600,169**
**PHOTOCHEMICAL ELECTROSTATIC COPYING SHEET AND PROCESS USING FREE RADICALS**
William R. Lawton, Salem, N.H., assignor to Bard Laboratories, Inc., Amherst, N.H.
No Drawing. Filed Nov. 25, 1966, Ser. No. 596,814
Int. Cl. G03g *5/02*
U.S. Cl. 96—1.5 7 Claims

An electrostatic light sensitive reproduction sheet employing a composition comprising in an insulating resinous binder an organic stable free radical and a precursor sensitive to light to be converted to transient free radicals reactive with the stable free radical to change the conductance of the sheet so that an electrostatic image can be formed.

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**3,600,170**
**IMAGE FORMING MATERIAL AND METHOD OF FORMING AN IMAGE THEREFROM**
Marilyn Levy, Red Bank, N.J., assignor to the United States of America as represented by the Secretary of the Army
No Drawing. Filed Sept. 2, 1969, Ser. No. 854,728
Int. Cl. B41m *5/26;* G03c *1/72*
U.S. Cl. 96—114.6 3 Claims

A dry photographic recording system is described that utilizes silver abietate as both the light sensitive element and the film-forming vehicle. The silver abietate is dissolved in an organic solvent and the resulting solution coated onto a suitable substrate. A print-out image formed by exposing the coated substrate through a negative to light is developed and at the same time desensitized to further action of light by heat.

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**3,600,171**
**SULFONAMIDES IN DIFFUSION TRANSFER SYSTEMS**
Roger M. Cole, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.
No Drawing. Filed Nov. 1, 1968, Ser. No. 772,798
Int. Cl. G03c *5/54*
U.S. Cl. 96—29 24 Claims

Positive images of increased maximum density in diffusion transfer systems are produced by processing the exposed photographic element in the presence of water-soluble non-silver halide reducing sulfonamides. The sulfonamides are preferably utilized in alkaline processing compositions comprising a silver halide developing agent and a silver halide solvent.

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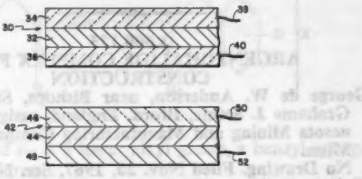
**3,600,172**
**PROCESS FOR PRODUCING IMAGE PATTERNS IN LAYERS COMPRISING ELECTROPHOTOLUMINESCENT MATERIALS**
Edwin H. Land, Cambridge, Mass., assignor to Polaroid Corporation, Cambridge, Mass.
Filed Dec. 11, 1968, Ser. No. 783,001
Int. Cl. G03c *1/92;* H01j *1/54*
U.S. Cl. 96—45.1 15 Claims




A process for producing image patterns in layers comprising electrophotoluminescent materials. Essentially the process involves the steps of employing an electroluminescent material to optically excite a layer comprising an electrophotoluminescent material so that the electrophotoluminescent material emits visible light. Thereafter, the excitation is discontinued but the layer comprising the electrophotoluminescent material is maintained under an electrical field and continues to emit visible light. While the layer continues to emit visible light, the subject matter to be reproduced is placed in juxtaposition with the layer for a time sufficient to permit a significant imagewise differential in decay of luminescence so that a positive reproduction of the subject matter is formed in the layer.

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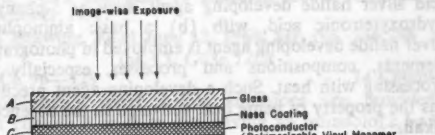
**3,600,173**
**PHOTOELECTROPOLYMERIZATION**
Steven Levinos, Vestal, N.Y., assignor to GAF Corporation, New York, N.Y.
Filed June 13, 1967, Ser. No. 645,768
Int. Cl. G03c *5/00*
U.S. Cl. 96—35.1 20 Claims




Method of photoelectropolymerization wherein incident light energy is converted to electrical energy in accordance with image being reproduced, said electrical energy being utilized to generate an electric current in an electrically conductive vinyl monomer layer and wherein generation of polymerization catalyst occurs electrolytically thereby leading to formation of a polymeric resist-image in accordance with the electrical energy, the catalyst generating material comprising a fluoborate or fluosilicate salt of a light-sensitive diazotized primary aromatic amine.

3,600,174

## HIGH-CONTRAST PHOTOGRAPHIC ELEMENTS AND METHOD FOR PROCESSING SAME

Kirby M. Milton, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Filed Aug. 18, 1967, Ser. No. 661,531
Int. Cl. G03c 5/24, 5/26
U.S. Cl. 96—50 14 Claims

High-contrast photographic elements comprising a support coated with a silver halide emulsion wherein the halide comprises at least about 85 mole percent chloride and having a heavy overcoat of a water-permeable colloid. Methods for processing these elements in a continuous transport processing machine wherein the developer contains a carbonyl bisulfite-amine condensation product are also described.

3,600,175

## ARGENTOHALIDE COMPLEX FILM CONSTRUCTION

George de W. Anderson, near Bishops, Stortford, and Grahame J. Stehle, Ilford, England, assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

No Drawing. Filed Nov. 20, 1967, Ser. No. 684,518
Claims priority, application Great Britain, Nov. 22, 1966, 52,310/66
Int. Cl. G03c 1/36, 5/26
U.S. Cl. 96—65 18 Claims

This invention discloses a film having at least one layer containing a light insensitive argentohalide complex, said layer being free of protic solvent, photosensitive silver halide crystals and photosensitive silver ions, said complex providing light sensitive silver halide in said layer upon contact with a protic solvent. Such films can be utilized by contacting the layer containing the light insensitive argentohalide complex with a protic solvent, resulting in the generation of photosensitive silver halide, and exposing and developing photosensitive silver halide by conventional photographic technology.

3,600,176

## PHOTOGRAPHIC ELEMENTS, COMPOSITIONS AND PROCESSES

Grant M. Haist and David A. Pupo, Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Filed Nov. 29, 1968, Ser. No. 780,231
Int. Cl. G03c 5/30
U.S. Cl. 96—66 16 Claims

A developing agent precursor which is a reaction product of (a) a 3,4-dihydroxy furan silver halide developing agent, such as ascorbic acid, or a hydroxytetronic acid silver halide developing agent, such as 5-phenyl-3-hydroxytetronic acid, with (b) a basic aminophenol silver halide developing agent is employed in photographic elements, compositions and processes, especially dry processing with heat. Such a developing agent precursor has the property of being heat activated in the absence of alkali.

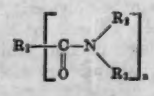
3,600,177

## LIQUID AMIDES AS SILVER HALIDE DEVELOPER SOLVENTS

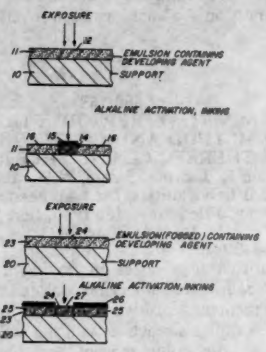
Thomas I. Abbott and Robert N. Woodward, Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Sept. 22, 1967, Ser. No. 669,863
Int. Cl. G03c 1/48
U.S. Cl. 96—76 18 Claims

Developer solvents having the following general formula:



wherein $n$ is 1 or 2; $R_1$ represents an alkyl group of at least four carbon atoms when $n$ is 1; $R_1$ represents an aryl group when $n$ is 2; and $R_2$ and $R_3$ may be hydrogen, lower alkyl of from 1 to 4 carbon atoms, or may represent an aryl group or may be joined to form a heterocyclic nucleus, are used for incorporating developers in photographic emulsions either alone or in conjunction with high boiling oil solvents.




3,600,178

## PHOTOGRAPHIC EMULSION CONTAINING A MERCAPTO OR THIOXO GROUP

Jozef Frans Willems, Wilrijk, Robrecht Julius Thiers, Brasschaat, and Frans Clement Heugebaert, Kontich, Belgium, assignors to Gevaert-Agfa N.V., Mortsel, Belgium

No Drawing. Filed Feb. 7, 1968, Ser. No. 703,572
Claims priority, application Great Britain, Feb. 15, 1967, 7,252/67
Int. Cl. G03c 1/48
U.S. Cl. 96—76 10 Claims

Photographic light-sensitive silver halide materials are described including a non-light-sensitive water-permeable colloid layer and having incorporated therein at least one organic compound comprising a mercapto group or a thioxo group showing thioxo-thiol tautomerism, a group rendering the compound fast to diffusion in said colloid layer and a group rendering the molecule water-soluble or alkali-soluble. The said organic compound prevents yellowing of the photographic material.

3,600,179

## ORGANIC PHOTO-MATERIAL OF INCREASED CONTRAST

Yoshikazu Yamada, Sierra Madre, and Lester F. M. Storm, Pasadena, Calif., assignors to Bell & Howell Company

Filed Mar. 14, 1968, Ser. No. 713,206
Int. Cl. G03c 1/52
U.S. Cl. 96—90 5 Claims

A photosensitive composition is disclosed yielding a color in light-struck areas and comprising an N-vinyl compound and a polymerization inhibitor. The inhibitor increases gamma, or contrast, by reducing photosensitivity to low levels of light without significantly decreasing photosensitivity to levels of light exposure used to make the image exposure.

3,600,180

## METHOD OF MAKING A BLEND OF FOGGED, DIRECT POSITIVE SILVER HALIDE EMULSIONS OF DIFFERENT GRAIN SIZES

Malcolm L. Judd and Fred W. Spangler, Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Filed Nov. 4, 1968, Ser. No. 773,327
Int. Cl. G03c *1/02, 1/10*
U.S. Cl. 96—94 6 Claims

A method of making a photographic element having at least one layer containing a blended grain silver halide emulsion, wherein the average grain size of at least two component emulsions of the blend differs by at least 50%, which comprises: preparing the respective component silver halide emulsions, blending the silver halide component emulsions, coating said emulsion blend on a support and reducing the liquid content of the coated blend; the improvement which comprises deferring the blending of the component emulsions of different grain size until just prior to coating and thereupon admixing the component blends and promptly thereafter coating the freshly formed admixture on the support whereby the support is coated with the minimum possible time delay between the time of admixing and the time of coating.

3,600,181

## FOG REDUCTION OF PHOTOGRAPHIC SILVER HALIDE EMULSIONS BY INCORPORATION OF A NITROCINNAMIC ACID, OR CINNAMALDEHYDE IN A CONTIGUOUS LAYER

Giacomo Luciani and Fritz Dersch, Binghamton, N.Y., assignors to GAF Corporation, New York, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 594,675, Nov. 16, 1966. This application July 10, 1967, Ser. No. 652,003
Int. Cl. G03c *1/34*
U.S. Cl. 96—109 18 Claims

Light-sensitive silver halide emulsions stabilized and made resistant to fogging with a cinnamic acid or cinnamaldehyde.

3,600,182

## PHOTOGRAPHIC GELATINS

Reinhard Matejec and Rudolf Meyer, Leverkusen, and Bruno Mücke, Cologne-Buchheim, Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany

No Drawing. Filed Oct. 9, 1968, Ser. No. 766,317
Int. Cl. G03c *1/04*
U.S. Cl. 96—114.7 2 Claims

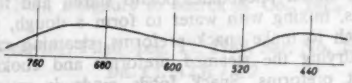
Photographic material having a gelatin-silver halide emulsion layer of which the gelatin containing catalase of more than 10 international activity units per gram.

3,600,183

## LIGHT-SENSITIVE MATERIAL

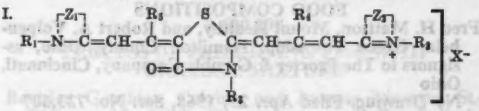
Herman Adelbert Philippaerts, Mortsel, Theofiel Hubert Ghys, Kontich, and Henri Depoorter, Mortsel, Belgium, assignors to Gevaert-Agfa N.V., Mortsel, Belgium

Filed Nov. 8, 1968, Ser. No. 774,410
Claims priority, application Great Britain, Nov. 27, 1967, 53,749/67
Int. Cl. G03c *1/28*
U.S. Cl. 96—123 3 Claims

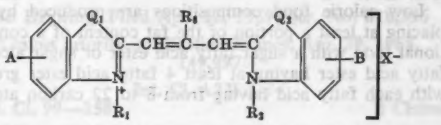



Panchromatic light-sensitive silver halide emulsions are provide, the sensitivity of which extends up to the extreme red (or near infrared) region of the spectrum by incorporating into said emulsions a rhodacarbocyanine whose sensitizing activity extends beyond 700 nm. and which corresponds to the following general Formula I and at least one carbocyanine corresponding to following general Formula II:

I.



II.



wherein:

each of $R_1$ and $R_2$ is a lower alkyl group, a benzyl group, or a phenyl group,

$R_3$ is a lower alkyl group, a phenyl group, or a benzyl group,

$R_4$ is alkoxy or an amino group,

$R_5$ is hydrogen, a lower alkyl group, a phenyl group or a benzyl group,

$R_6$ is lower alkyl,

each of $Z_1$ and $Z_2$ represents the non-metallic atoms necessary to complete the same or different thiazole nucleus, benzothiazole nucleus, naphthothiazole nucleus, selenazole nucleus, benzoselenazole nucleus, or naphthoselenazole nucleus,

each of $Q_1$ and $Q_2$ is sulphur or selenium,

each of A and B is hydrogen, a fused aromatic ring, tetramethylene, methylene dioxy or one or more substituents selected from lower alkyl, phenyl, alkoxy, lower alkylthio, halogen and hydroxyl, and

$X^-$ is an anion when one of $R_1$ and $R_2$ does not contain an anionic group.

3,600,184

## SILVER HALIDE PHOTOGRAPHIC MATERIALS SENSITIZED WITH A METHINE DYE HAVING AN ISOINDOLO[2,1 - a]BENZIMIDAZOL - 11 - YL MOIETY

Leslie G. S. Brooker, Rochester, and Gene L. Oliver, Pittsford, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Filed June 12, 1968, Ser. No. 736,288
Int. Cl. G03c *1/08*
U.S. Cl. 96—129 14 Claims

Photographic silver halide emulsions are provided which contain a methine dye having an isoindolo[2,1-a] benzimidazol-11-yl moiety.

3,600,185

## PHOTOGRAPHIC PRODUCTION OF ELECTRICALLY CONDUCTING METAL LAYERS

Hugh G. McGuckin, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Filed Oct. 2, 1967, Ser. No. 671,972
Int. Cl. G03c *5/00*
U.S. Cl. 96—36.2R 16 Claims

Highly reflecting, electrically conducting metal layers are produced employing photographic means, wherein a binder-free, chemically reduced layer of silver nuclei

forms a receptive surface upon which the conducting metal layers are deposited by means of diffusion transfer, photoresist and plating techniques.

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3,600,186
LOW CALORIE FAT-CONTAINING FOOD COMPOSITIONS
Fred H. Mattson, Mount Healthy, and Robert A. Volpenhein, Green Township, Hamilton County, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio
No Drawing. Filed Apr. 23, 1968, Ser. No. 723,607
Int. Cl. A23l *1/00;* A21d *2/16, 13/06*
U.S. Cl. 99—1 6 Claims

Low calorie food compositions are produced by replacing at least a portion of the fat content of a conventional food with a sugar fatty acid ester or sugar alcohol fatty acid ester having at least 4 fatty acid ester groups with each fatty acid having from 8 to 22 carbon atoms.

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3,600,187
FAT SUPPLEMENT FOR FEED RATION, AND METHOD OF PREPARING SAME
Gilbert D. Elenbogen, Skokie, Ill., assignor to Vitamins, Inc., Chicago, Ill.
No Drawing. Continuation-in-part of application Ser. No. 426,390, Jan. 18, 1965. This application Mar. 14, 1968, Ser. No. 712,935
Int. Cl. A23k *1/00*
U.S. Cl. 99—2 5 Claims

The method of making a fat supplement for animals in the form of a homogeneous emulsion of about 30 to 70% edible fat, about 10 to 30% nontoxic alkylene glycol, about 1 to 5% emulsifying agent and about 8–30% water whereby, a mixture of non-toxic alkylene glycol and water is formed, a portion of the emulsifying agent is added to the mixture, the remaining emulsifying agent is added to the edible fat, the water-glycol mixture and fat are mixed at about 100° F. to 140° F. and the resulting mixture is homogenized at a pressure of about 500 to 2000 pounds per square inch.

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3,600,188
ANIMAL FEED MANUFACTURE
Morris D. Wilding, Downers Grove, and David M. Miller, Forest Park, Ill., assignors to Swift & Company, Chicago, Ill.
Filed July 18, 1967, Ser. No. 654,080
Int. Cl. A23k *1/00;* C05c *9/00*
U.S. Cl. 99—2 11 Claims

Urea and proteinaceous materials having known nutritive value are intimately mixed at elevated temperatures and pressures and subsequently extruded. The resulting elongated particles may be subdivided and possess excellent slow release of urea properties. A wide range of proteinaceous materials and operating conditions are set forth.

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3,600,189
ANIMAL FEED SUPPLEMENT
Armando R. Raynal, Chihuahua, Chihuahua, Mexico, assignor to Alicia Raynal de Zea, Patricia Raynal de Prado and Rosa I. Raynal, fractional part interest to each
No Drawing. Filed May 24, 1968, Ser. No. 731,719
Int. Cl. A23k *1/02*
U.S. Cl. 99—6 4 Claims

A pulverulent animal feed supplement which may be fed free choice which comprises particular proportions of urea, calcium-phosphorous dietary supplement, sodium chloride, calcium carbonate, non-fermented or fermented molasses, dehydrated alfalfa, sulfur, trace elements and vitamin A which supplement in addition to providing an additional approximately 1% protein to the diet of ruminants eating substantially grass, creates a rumen flora that has been found to keep the cattle in good shape on a 6% protein diet.

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3,600,190
PRODUCTION OF ANIMAL FEED FROM SUGAR CANE STRIPPING MILL
William W. Worden, P.O. Box 1053, Ewa, Hawaii 96706
No Drawing. Filed May 12, 1967, Ser. No. 637,937
Int. Cl. A23k *1/06*
U.S. Cl. 99—8 2 Claims

An animal feed made from compressed and partially dehydrated sugar cane leaves and tops and a process for making animal feed from such sugar cane waste products by removing most of the moisture content in order to prevent spoilage and then compressing the material to obtain a more easily handled product.

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3,600,191
METHOD OF SOLUBILIZING FUMARIC ACID
Aubrey P. Stewart, Jr., and Gene J. Freemyer, Corning, Iowa, assignors to Allied Chemical Corporation, New York, N.Y.
Filed Mar. 19, 1968, Ser. No. 714,229
Int. Cl. A23l *1/00*
U.S. Cl. 99—78 7 Claims

Fumaric acid powder is pelletized with a crystallizing syrup of a water-soluble food acidulant. Following completion of crystallization the pellets are pulverized to a diameter of 10 to 80 microns.

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3,600,192
METHOD OF PRODUCING FRIED RICE FOR INSTANT COOKING
Tatsuro Tanaka, Kyoto, and Yoshitaka Sato, Ibaraki-shi, Japan, assignors to Nissin Shokuhin Kaisha Ltd., Takatsuki, Japan
No Drawing. Filed Dec. 22, 1967, Ser. No. 692,634
Int. Cl. A23l *1/10*
U.S. Cl. 99—80 4 Claims

The present invention provides for a method of producing fried rice for instant cooking comprising drying boiled rice until the water content of the rice is between 10–20%, and frying the dried rice for 10–20 seconds at a temperature between 356–428° F. (180–220° C.), thereby dehydrating and swelling the rice.

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3,600,193
FOOD COMPOSITIONS FOR PREPARING SNACK FOOD PRODUCTS
Elmer F. Glabe, Chicago, and Perry W. Anderson, Niles, Ill., assignors to Milk Research, Inc., Fond du Lac, Wis.
No Drawing. Filed Mar. 28, 1968, Ser. No. 717,014
Int. Cl. A23l *1/10*
U.S. Cl. 99—83 11 Claims

Compositions for making snack food are prepared by dry blending corn flour, gelatinized corn flour, tapioca starch and milk solids (e.g., nonfat dry milk, whole milk solids, or buttermilk solids), with or without sodium chloride, starch phosphate, potato starch and flavoring materials, mixing with water to form a dough, shaping the dough to make snack preforms, steaming said preforms, drying the steamed preforms and cooking the resultant preforms. Snack foods made in accordance with the invention are puffed or expanded, porous and not dense, have a good flavor, and have a desirable texture for eating.

3,600,194

## METHOD OF PREPARING FERMENTED SAUSAGE PRODUCTS

Richard D. Trelease, Downers Grove, Ill., and Cleo A. Rinehart, Boone, Iowa, assignors to Swift & Company, Chicago, Ill.

No Drawing. Filed Oct. 21, 1968, Ser. No. 769,362

Int. Cl. A22c *11/00*

U.S. Cl. 99—109 6 Claims

Sweet-sour flavored sausage products and an improved method of controlling the characteristic sweet-sour flavor by incorporating sufficient fermentable sweeteners to produce the desired tangy or sour flavor when fermented, and sufficient artificial nonfermentable sweeteners to produce the desired sweet flavor in the final product.

3,600,195

## MARGARINE OIL

Herbert Willem Lincklaen Westenberg, Vlaardingen, Netherlands, assignor to Lever Brothers Company, New York, N.Y.

No Drawing. Filed Feb. 27, 1968, Ser. No. 713,268

Claims priority, application Luxembourg, Feb. 27, 1967, 53,075

Int. Cl. A23d *3/00*

U.S. Cl. 99—122 9 Claims

A fat blend suitable for use as the fat phase in margarine contains specified proportions of an interesterified mixture of a liquid fat containing at least 40% poly-unsaturated fatty acids with a fat hardened to melt at 42–48° C. and containing at least 10% of $C_{20}$ to $C_{22}$ acids. Additional fats make up the blend to give dilatation values affording a spreadable margarine without incurring the effects of oil exudation and preferably comprise vegetable fats hardened to melt at 32–38° C. with up to 10% of others hardened to 42–48° C. which may themselves be interesterified.

3,600,196

## NOVEL CREAM PRODUCTS AND THEIR PREPARATION

Christian Heine, Monheim, Rhineland, and Clemens von Schilcher, Leverkusen, Germany, assignors to Henkel & Cie G.m.b.H., Dusseldorf, Germany

No Drawing. Continuation of application Ser. No. 552,402, May 24, 1966. This application Nov. 18, 1969, Ser. No. 871,680

Claims priority, application Germany, July 16, 1965, H 56,608

Int. Cl. A23g *3/00*

U.S. Cl. 99—134A 13 Claims

Cream products comprising 50 to 70% of shortening having a solids content of 10 to 15% at 20° C. and 5 to 10% at 30° C. and 20 to 30% of sugar and optional up to 30% of other powdered ingredients and having 20 to 150 cc. of an inert gas dispersed there through per 100 grams of product.

3,600,197

## FLAVOR ENHANCING COMPOSITIONS FOR FOODS AND BEVERAGES

Herbert D. Spangler, Philadelphia, Pa., and Paul A. Hammes, Westfield, and Charles W. Everson, Martinsville, N.J., assignors to Merck & Co., Inc., Rahway, N.J.

No Drawing. Filed Aug. 27, 1968, Ser. No. 755,728

Int. Cl. A23l *1/22*

U.S. Cl. 99—140 10 Claims

A composition in which stratification and segregation of the ingredients is retarded, without retarding the flowability thereof, for use in foods and beverages to improve flavor comprising a premix of salt with a blend of (a) an additive which is an edible glycerol or propylene glycol $C_{12}$ to $C_{18}$ fatty acid monoester, or acetylated derivatives thereof; and (b) a mixture of sodium glutamate with flavor enhancing 5'-nucleotides.

3,600,198

## PROCESS OF PRESERVING FISH WITH BIOCIDAL MIXTURE

Beatrice Gonthier, Caluire, and Jacques Mocotte, St.-Didier-au-Mont-d'Or, France, assignors to Progil, Paris, France

No Drawing. Filed Apr. 22, 1969, Ser. No. 818,396

Claims priority, application France, Apr. 29, 1968, 149,997

Int. Cl. A23l *3/34*

U.S. Cl. 99—158 8 Claims

Fish are preserved by contacting with ice or an aqueous solution containing a mixture of propionic acid and benzoic acid buffered to a pH less than 7 by adding to the acids their corresponding salts of alkali metals or magnesium.

3,600,199

## METHOD OF PRESERVING POTATOES AND OTHER ROOT VEGETABLES BY FREEZING AND COLD STORAGE

Frederik Otto Ornbaek, 27 Nokkedalen, 2730 Herlev, Denmark

No Drawing. Filed Dec. 19, 1968, Ser. No. 785,333

Int. Cl. A23b *7/00, 1/06*

U.S. Cl. 99—193 1 Claim

The invention relates to a method of preserving potatoes by freezing in such manner that the taste and other qualities of the potato is unimpaired.

3,600,200

## METHOD OF PRESERVING FROZEN FRESH RED MEAT

Harry F. Bernholdt, Park Forest, and Harry L. Roschen, Forest Park, Ill., assignors to Swift & Company, Chicago, Ill.

No Drawing. Filed Dec. 26, 1968, Ser. No. 787,239

Int. Cl. A23b *1/00*

U.S. Cl. 99—194 8 Claims

A process for preserving frozen red meat cuts so that they may be displayed under relatively high light intensities for prolonged periods of time without discoloration is set forth.

3,600,201

## HARD FACING ALLOY COMPOSITION AND METHOD OF MANUFACTURE

Samuel P. Alessi, Homewood, Ill., assignor to Borg-Warner Corporation, Chicago, Ill.

No Drawing. Filed Nov. 29, 1968, Ser. No. 780,204

Int. Cl. C09d *1/00;* C23c *3/00*

U.S. Cl. 106—1 6 Claims

A hard facing composition is disclosed herein which contains carbon, chromium, nickel, silica, manganese, boron and iron. The composition is applied to metal surfaces to provide a fused metallic hard facing on the surface when the material is heated to melting temperature.

3,600,202
## MOLDABLE WAX COMPOSITIONS
David M. MacLeod, Sarnia, Ontario, Canada, assignor to Esso Research and Engineering Company
No Drawing. Filed Oct. 11, 1968, Ser. No. 766,993
Int. Cl. B28b 7/28; C08h 9/00; C09d 11/00
U.S. Cl. 106—20 7 Claims

Moldable high strength petroleum wax compositions are prepared involving the use of a major amount of (A) a refined paraffin wax having a melting point of between about 145° and about 155° F., (B) a small amount of a microcrystalline wax having a melting point of between about 170° and about 200° F. and a needle penetration of between about 4 and about 12 mm./10, measured at 77° F., and (C) a small amount of a soft intermediate wax having a melting point of between about 125° and about 140° F. and a needle penetration of between about 18 and about 30 mm./10, measured at 77° F., the blended wax composition having a cloud point of between about 152 and about 163° F. Inert fillers, pigments, dyes and the like, in minor amounts, may be blended with the three component wax compositions for various specific uses.

3,600,203
## FLUIDIZED MOLDING MATERIAL FOR MANUFACTURING CORES AND MOLDS AND A METHOD THEREFOR
Adolfo Aldera, Turin, Italy, assignor to Centro Sperimentale Metallurgico Società per Azioni, Rome, Italy
No Drawing. Continuation-in-part of application Ser. No. 674,003, Oct. 9, 1967. This application Sept. 5, 1969, Ser. No. 855,767
Int. Cl. B28b 7/28
U.S. Cl. 106—38.3 8 Claims

The fluidized molding material contains sand, an aluminous cement or a mixture of aluminous cement with other cements, a lithium salt which is an accelerating agent for the setting of the aluminous cement, a tensioactive agent with a foaming action and water and is prepared by mixing these components. The setting time of this molding material may be varied without substantial change in the mechanical strength of the cast product by varying the proportion of lithium salt.

3,600,204
## GLASS-CERAMIC ARTICLE PREPARED FROM LOW EXPANSION THERMALLY DEVITRIFIABLE GLASS FRIT
George H. Beall and David A. Duke, Corning, N.Y., assignors to Corning Glass Works, Corning, N.Y.
Filed May 31, 1968, Ser. No. 733,613
Int. Cl. C03c 3/04, 3/22
U.S. Cl. 106—39DV 1 Claim

This invention relates to the production of a devitrifiable glass frit having a composition within the $Li_2O$-$Al_2O_3$-$SiO_2$ field which exhibits, after devitrification, a coefficient of thermal expansion (0°–1000° C.) of less than $15\times10^{-7}$/° C. and excellent dimensional stability when subjected for long periods of time at temperatures up to 900° C. Such a frit is especially suitable for the manufacture of regenerative heat exchanger bodies for use with gas turbines.

3,600,205
## BORIC OXIDE-FREE GLASS FIBERS AND COMPOSITIONS FOR MAKING THEM
Jean Claude Breton, Chambery, France, assignor to Compagnie de Saint-Gobain, Neuilly-sur-Seine, France
No Drawing. Filed July 7, 1967, Ser. No. 651,693
Claims priority, application France, July 11, 1966, 68,950
Int. Cl. C03c 13/00
U.S. Cl. 106—50 10 Claims

Good quality glass fibers are produced with satisfactory properties inter alia for making mats, insulation and textiles, and for reinforcing plastics, at fibering temperatures much lower than those used with the present, standard fibering glass, at lower cost, and in some cases at temperatures which permit the substitution of refractory metals other than platinum in the construction of fibering apparatus.

3,600,206
## $MgO$-$P_2O_5$ FUSED CAST REFRACTORY
Allen M. Alper and Robert N. McNally, Corning, N.Y., assignors to Corhart Refractories Company, Louisville, Ky.
No Drawing. Filed Feb. 27, 1969, Ser. No. 803,053
Int. Cl. C04b 35/04
U.S. Cl. 106—58 7 Claims

Thermal shock resistant, fused cast refractory composed of, by weight on an oxide basis, 4 to 20% $P_2O_5$, 0 to 25% CaO, BaO, SrO and mixtures thereof, 0 to less than 10% $SiO_2$, $B_2O_3$, $ZrO_2$, $Cr_2O_3$ and mixtures thereof, 0 to 5% halogen and the balance being at least 69% MgO and less than 1% incidental impurities. Microstructure essentially being a major phase of periclase crystals in a labyrinthine pattern defined by a large amount of direct bonding between adjacent periclase crystals and by a minor phosphate randomly interspersed among the periclase crystals.

3,600,207
## NON-SHRINK GROUT MIXTURE
John K. Bull, 1250 W. 32nd Ave., Vancouver, British Columbia, Canada
Filed Feb. 14, 1969, Ser. No. 799,272
Int. Cl. C04b 7/32
U.S. Cl. 106—87 3 Claims

A hydraulic setting, acid resistant, non-shrink grout mixture, the essential components of which are calcium aluminate cement, cementitious calcium aluminate fine aggregate and aluminum powder.

3,600,208
## SYNTHETIC FILM MATERIALS
Terence Arnold Abbott, Margaret Loudon Clachan, David Rankine Kennedy, and Basil Robert Shephard, Brantham, Manningtree, England, assignors to Bexford Limited, Manningtree, England
No Drawing. Filed Aug. 7, 1967, Ser. No. 658,646
Claims priority, application Great Britain, Aug. 10, 1966, 35,786/66
Int. Cl. G03c 1/80
U.S. Cl. 117—7 4 Claims

This application describes a film base material consisting of a film biaxially orientated and heat-set polyethylene terephthalate having thereon a thin layer of either copolymer of vinylidene chloride containing not less than 35 mole percent of vinylidene chloride or of a homopolymer of vinylidene chloride, this said layer having been applied to the polyethylene terephthalate before it has been fully biaxilly oriented and heat-set; and having superimposed on said layer a layer A, the said layer A consisting predominantly of a polyvinyl halogenoester, or a polyvinyl cyanoester or a copolymer of a vinyl-halogenoester or a vinyl-cyanoester with an alpha-beta unsaturated carboxylic acid with acrylamide or methacrylamide or their N-methylol derivatives or with vinyl acetate and/or alcohol, the said layer A having been applied to the film after it has been fully biaxially orientated and heat-set.

3,600,209
## SUEDE-LIKE SHEET MATERIAL OF AN ACRYLIC POLYMER CONTAINING AN ADDITIVE
Charles A. Young, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.
No Drawing. Filed June 18, 1968, Ser. No. 737,826
Int. Cl. D06c 11/00; B44c 1/20
U.S. Cl. 117—8 19 Claims

An improved supple, synthetic, microporous vapor permeable suede sheet material of a non-woven synthetic

nexible fibrous web that is impregnated with a polymeric binder of an acrylic polymer and about 0.1–20 parts of additive per 100 parts of polymer where the additive is either a hydrocarbon oil, silicone oil, alkyl oleate, or dialkyl sebacate.

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**3,600,210**
**TRANSPARENT XEROCOPIES**
**Barry Francis Haycock, Wollescote, Stourbridge, England, assignor to The International Nickel Company, Inc., New York, N.Y.**
**No Drawing. Filed Feb. 26, 1968, Ser. No. 707,943**
**Claims priority, application Great Britain, Feb. 28, 1967, 9,392/67**
**Int. Cl. G03g *13/16, 13/20***
**U.S. Cl. 117—17.5** **7 Claims**

Positive xerographic transparencies are produced by transferring the image-forming thermoplastic powder (toner) particles from a photosensitive surface to a transparent film, heating the image and the film to a temperature only sufficient to soften the thermoplastic toner particles without damaging the transparent film and then, in a separate operation, heating and pressing the image-bearing film to fuse the particles to the film and to provide a sharp transparent copy.

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**3,600,211**
**MARKING RIBBON**
**Serge Ferrari, Charly, Rhone, France**
**Continuation-in-part of application Ser. No. 571,331, Aug. 9, 1966. This application Nov. 18, 1969, Ser. No. 877,801**
**Claims priority, application France, Oct. 8, 1965, 34,288**
**Int. Cl. B44d *1/092*; C09k *1/04***
**U.S. Cl. 117—33.5** **5 Claims**

A multi-colored marking ribbon according to the invention is made of a long band of rot-proof fabric the two faces of which are provided with a waterproof coating having a predetermined background color and with a plurality of oblique colored bands having a color which stands out against the color of the background. The colored bands on any given face of the ribbon extend diagonally relative to the colored bands on the other face of the ribbon. Furthermore, the colored bands on one face of the ribbon are displaced longitudinally with respect to the colored bands on the other face of the ribbon. The result is a sort of flickering effect due to the fact that the colored bands appear to carry out a back and forth attracting movement upon the least tremor.

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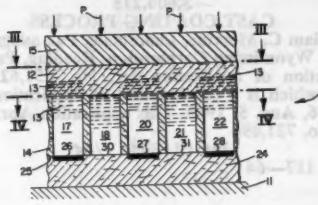
**3,600,212**
**CONTACT COPYING PROCESS**
**Mortimer M. Labes, Rosemont, Pa., assignor to Drexel University, Philadelphia, Pa.**
**Original application Dec. 11, 1967, Ser. No. 689,666, now Patent No. 3,527,666, dated Sept. 8, 1970. Divided and this application Oct. 24, 1969, Ser. No. 871,181**
**Int. Cl. B41m *5/02, 3/12***
**U.S. Cl. 117—37** **12 Claims**

A pressure sensitive copying material is provided, which utilizes a sheet of material having a plurality of capillary pores therein, for receiving and retaining an image-forming material from a carrier therefor, with the image-forming material being drawn into capillaries at different rates, depending upon whether the sheet to be




copied is disposed with printed or other images adjacent ends of particular capillaries, or if an unprinted or unimaged surface portion of the sheet to be copied is disposed against ends of the capillaries.

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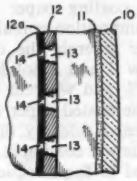
**3,600,213**
**APERTURE MASKS**
**Lloyd G. Arndt, St. Paul, Minn., assignor to Buckbee-Mears Company, St. Paul, Minn.**
**Filed Sept. 12, 1969, Ser. No. 857,437**
**Int. Cl. C23c *11/08, 11/10***
**U.S. Cl. 117—46CG** **3 Claims**




An improved method for temporarily reducing the diameter of the apertures in a shadow mask by vapor depositing a layer of carbon on a preformed aperture mask.

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**3,600,214**
**PREPARING THERMOPLASTICS FOR DYEING**
**Roland Feinauer, Haltern, and Wolfgang Seeliger, Johann Schlimme van Brunswijk, and Hans Busch, Marl, Germany, assignors to Chemische Werke Huels Aktiengesellschaft, Marl, Germany**
**No Drawing. Filed Aug. 26, 1968, Ser. No. 755,428**
**Claims priority, application Germany, Sept. 15, 1967, C 43,352**
**Int. Cl. B44d *1/48***
**U.S. Cl. 117—62.1** **19 Claims**

The dye receptivity and antistatic properties of polymeric materials, e.g. synthetic hydrophobic polymers, e.g. polyethylene terephthalate, are improved by absorbing into polymers (prior to dyeing) a bicyclic amidoacetal, and subjecting said amidoacetal to ring cleavage, said ring cleavage being effected at 20–100° C. by contact with a liquid which has as an essential ingredient thereof a member selected from the group consisting of

(a) water,

(b) a carboxylic acid having from 1–18 carbon atoms; and

(c) an anhydride of (b),
the resultant cleaved molecules being dyeable and difficult to remove from the polymer.

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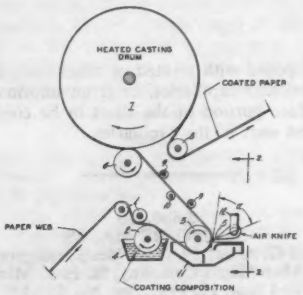
3,600,215
CAST COATING PROCESS
William C. Mervine, Laureldale, Pa., assignor to Wyomissing Corporation, Reading, Pa.
Continuation of application Ser. No. 651,625, July 6, 1967, which is a continuation of application Ser. No. 299,906, Aug. 5, 1963. This application Apr. 16, 1968, Ser. No. 721,694
Int. Cl. B44d *1/44*
U.S. Cl. 117—64 21 Claims




A method of cast coating paper with an aqueous mineral cast-coating composition containing casein or soy bean protein as binder wherein the composition has a pH above 5 and below 7 and a solids content of from about 45 to about 60% and wherein the wet coating is partially dried, while the coated paper web is moving and supported on its uncoated side, by directing a uniform jet stream of air onto the wet coating in a direction toward the coating but opposed to the direction of travel of the paper web.

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3,600,216
PROCESS FOR ADHERING POLY-p-XYLYLENE TO SUBSTRATES USING SILANE PRIMERS AND ARTICLES OBTAINED THEREBY
Donald D. Stewart, Plainfield, N.J., assignor to Union Carbide Corporation, New York, N.Y.
No Drawing. Filed Sept. 6, 1968, Ser. No. 758,136
Int. Cl. B44d *1/14;* B32b *27/06*
U.S. Cl. 117—72 30 Claims

This invention relates to the adhesion of vapor deposited poly-p-xlylene to solid substrates through the use of ethylenically unsaturated silicon compounds having at least one hydrolyzable and or condensible group.

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3,600,217
PROCESS FOR PRETREATING POLYESTER FILM SUPPORT FOR THE COATING WITH PHOTOGRAPHIC EMULSIONS
Georg Eichhorn and Lothar Richter, Berlin-Kopenick, Germany, assignors to VEB Fotochemische Werke Berlin, Berlin-Kopenick, Germany
No Drawing. Filed Mar. 4, 1968, Ser. No. 709,888
Int. Cl. B91m *1/18;* G03c *1/78*
U.S. Cl. 117—76 9 Claims

A process for pretreating a film support in order to increase its adhesiveness for the application of photographic emulsions, said support consisting of high molecular weight thermoplastic foils, particularly polyethylene terephthalate, wherein a substratum is used whose reactive components react on the support proper under the influence of heat.

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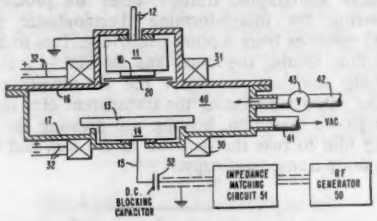
3,600,218
METHOD FOR DEPOSITING INSULATING FILMS OF SILICON NITRIDE AND ALUMINUM NITRIDE
William B. Pennebaker, Carmel, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.
Continuation-in-part of application Ser. No. 494,789, Oct. 11, 1965. This application May 15, 1968, Ser. No. 729,280
Int. Cl. C23c *11/14, 15/07*
U.S. Cl. 117—93.1GD 11 Claims




A substrate and source, of silicon (Si) or aluminum (Al), are positioned within a nitrogen-containing atmosphere of less than 20 microns. Radio-frequency energy is applied across the substrate and source to generate a plasma containing source material, and nitrogen which react so as to deposit a thin insulating film, e.g., of silicon nitride ($Si_3N_4$) or aluminum nitride (AlN), respectively, on the substrate surface. Preferably, the substrate is maintained in excess of 300° C. during the deposition process.

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3,600,219
PROCESS FOR THE FLAME-PROOFING OF FIBROUS MATERIALS CONSISTING OF POLYESTER FIBERS AND CELLULOSE FIBERS
Martin Reuter, Kronberg, Claus Beermann, Neu-Isenburg, and Fritz Linke, Kelkheim, Taunus, Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany
No Drawing. Filed Sept. 26, 1968, Ser. No. 763,013
Claims priority, application Germany, Sept. 30, 1967, P 16 19 055.9
Int. Cl. C09k *3/28;* D06m *13/44*
U.S. Cl. 117—136 2 Claims

Fibrous materials essentially consisting of mixtures of polyesters and cellulose are rendered fire-proof by treatment with the ammonium salt of bis-(hydroxymethyl)-phosphinic acid. This treatment improves, furthermore, the soft handle of the goods.

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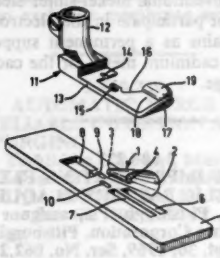
3,600,220
FABRIC FOLDING DEVICE FOR SEWING MACHINES, PARTICULARLY SUITABLE FOR EDGED POCKET
Nerino Marforio, Milan, Italy, assignor to S.p.A. Virginio Rimoldi & C., Milan, Italy
Filed Sept. 25, 1969, Ser. No. 860,920
Claims priority, application Italy, Oct. 15, 1968, 22,498/68
Int. Cl. D05b *35/02*
U.S. Cl. 112—141 4 Claims

A fabric folding device for a sewing machine is provided including a scroll body having an inlet opening for

receiving a work edge to be folded and a delivery opening located adjacent to the sewing needle of the machine, and a presser foot mounted for movement relative to the scroll body and having a central body located in front



of and in alignment with the inlet opening of the scroll body. The central body cooperates with a feeding device of the machine and the scroll body to advance the work edge through the scroll to fold the work edge and to feed the folded work past the needle.

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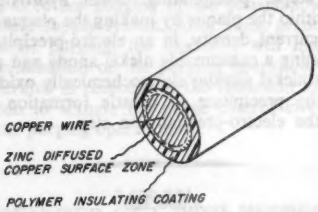
**3,600,221**
**ZINC DIFFUSED COPPER**
**Louis E. Hibbs, Jr., Schenectady, N.Y., assignor to General Electric Company**
**Continuation-in-part of application Ser. No. 720,201, Apr. 10, 1968. This application Feb. 6, 1969, Ser. No. 797,201**
**Int. Cl. B44d *1/18***
**U.S. Cl. 117—217** **23 Claims**




The surface of a copper body which may, for example, be a coating, foil or wire, is provided with a zinc coating. The zinc coating is diffused into the copper surface to form an alloy surface zone which protects and preserves the properties of materials such as polymers and carbon that ordinarily degrade when contacted with copper.

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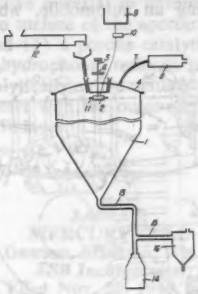
**3,600,222**
**DRIED SUCROSE-CONTAINING PRODUCTS FROM SEPARATE FEEDS**
**Preston Leonard Veltman, Clarksville, Md., Johannes C. J. Verdonk, Zoog Zaandijk, Netherlands, and Lars Olav Thomsen, Viby, Aarlus, Denmark, assignors to W. R. Grace & Co., New York, N.Y.**
**Filed Nov. 25, 1969, Ser. No. 879,668**
**Claims priority, application Great Britain, Nov. 26, 1968, 56,144/68**
**Int. Cl. C13f *1/02, 3/00***
**U.S. Cl. 127—30** **12 Claims**

A process for producing solid sugars wherein separate feeds of sucrose solution and of fine sucrose particles are dispersed in a current of heated air, whereby the particles are coated with the solution which is evaporated leaving



a solid product containing substantially all the sugar fed to the process.

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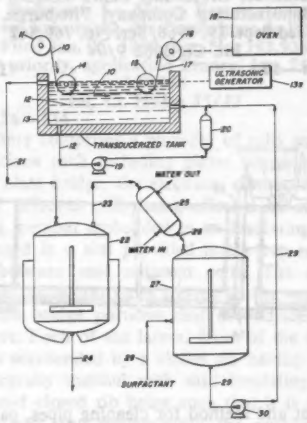
**3,600,223**
**PROCESS FOR CLEANING POLYGLYCOLIC ACID FILAMENTS USEFUL AS ABSORBABLE SURGICAL SUTURES**
**Arthur Glick and Edward Joseph McCusker, Danbury, Conn., assignors to American Cyanamid Company, Stamford, Conn.**
**Filed Dec. 15, 1969, Ser. No. 884,867**
**Int. Cl. B08b *7/00***
**U.S. Cl. 134—1** **10 Claims**




Polyglycolic acid filaments containing surface soil are effectively cleaned by contacting them with ultrasonically agitated solutions, said solutions comprising a solvent and from 1% to 10% by weight of a biologically innocuous surfactant.

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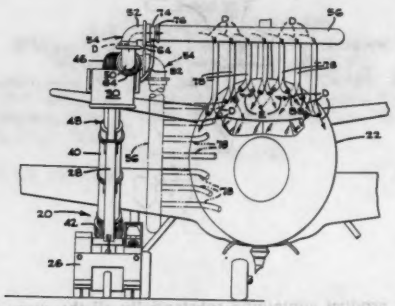
**3,600,224**
**METHOD AND APPARATUS FOR CLEANING LARGE SURFACES**
**Robert E. Stilwell, Santa Clara, Calif., assignor to FMC Corporation, San Jose, Calif.**
**Filed Nov. 18, 1968, Ser. No. 776,494**
**Int. Cl. B08b *1/00, 3/10***
**U.S. Cl. 134—6** **29 Claims**

Apparatus for cleaning airplanes or automobiles is disclosed in which high velocity air and a cleansing fluid is discharged through a plurality of cloth sleeves, the outer

ends of which buffet the surface to be cleaned. For cleaning an airplane, a wheeled carriage has a blower which is connected by ducting supported by a boom to the sleeves. For cleaning an automobile, which is moved



along a path, a frame straddles the path and supports a plurality of blowers. The blowers are connected by ducting to a plurality of cloth sleeves which whip against the surface of the automobile as air and cleaning fluid are discharged out the open ends of the sleeves.

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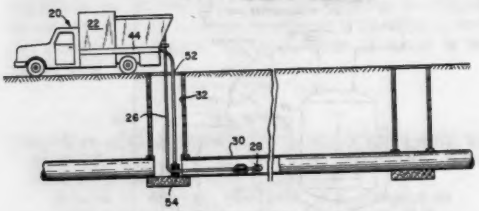
**3,600,225**
**PIPE CLEANING**
**Bruce R. Parmelee, Greenbrae, Calif., assignor to Rockwell Manufacturing Company, Pittsburgh, Pa.**
**Filed Sept. 19, 1968, Ser. No. 760,862**
**Int. Cl. B08b *9/04***
**U.S. Cl. 134—10** **10 Claims**



Equipment and method for cleaning pipes, particularly sewer lines, in which the cleaning action is effected by jets of water issuing from a self-propelled nozzle. The water for supplying the jets is taken from the sewer and pumped under high pressure to the nozzle after the removal and collection of grits and other fines.

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**3,600,226**
**METHOD FOR MAKING CADMIUM ELECTRODES FOR NICKEL-CADMIUM CELLS**
**Edwin J. McHenry, Millington, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill and Berkeley Heights, N.J.**
**Continuation-in-part of application Ser. No. 704,392, Feb. 9, 1968. This application Apr. 24, 1969, Ser. No. 824,351**
**Int. Cl. H01m *43/04***
**U.S. Cl. 136—24** **5 Claims**

The disclosure describes a simple, economical, yet effective method for making cadmium electrodes for nickel-cadmium batteries by pressing together cadmium oxide and copper oxide powders around a conductive support screen and electrochemically reducing the oxides. The copper resulting from the reducing process forms into a continuous copper lattice resembling the porous nickel structure of the conventional nickel-sinter electrode. Since the copper does not participate in the electrochemistry of the battery it remains as a permanent support structure for containing the cadmium metal, or the cadmium oxide formed on discharge.

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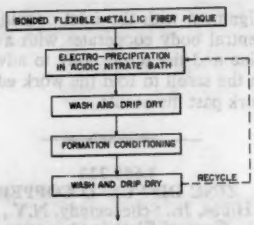
**3,600,227**
**METHOD OF IMPREGNATING FLEXIBLE METALLIC BATTERY PLAQUES**
**Carl C. Hardman, Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.**
**Filed Sept. 30, 1969, Ser. No. 862,284**
**Int. Cl. H01m *35/30***
**U.S. Cl. 136—76** **10 Claims**




A method of loading active battery material into porous, flexible, metallic battery plaques, comprises the following steps: precipitating nickel hydroxide active material within the plaque by making the plaque cathodic, at a high current density, in an electro-precipitation cell also containing a consumable nickel anode and a solution comprising nickel nitrate; electrochemically oxidizing and reducing the precipitate in caustic formation solution; repeating the electro-precipitation step.

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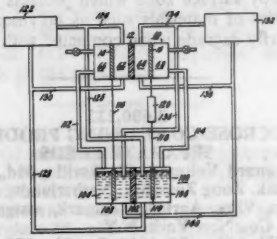
**3,600,228**
**MULTIPLE ELECTROLYTE HIGH VOLTAGE CELL**
**Anthony Basil La Conti, Lynnfield, Mass., assignor to General Electric Company**
**Filed Apr. 4, 1966, Ser. No. 539,810**
**Int. Cl. H01m *27/26*; C01b *13/04***
**U.S. Cl. 136—86** **5 Claims**



The potential of a fuel cell is increased by placing an alkaline electrolyte adjacent the anode and an acid electrolyte adjacent the cathode. The alkaline and acid elec-

trolytes are separated by a cation exchange membrane. Hydrogen and oxygen may be obtained by electrolysis at a lower impressed potential than with cells having an acid or alkaline electrolyte only. The hydrogen evolving electrode is placed in contact with the acid electrolyte and the oxygen evolving electrode contacts the alkaline electrolyte with the cation exchange membrane separating the electrolytes.

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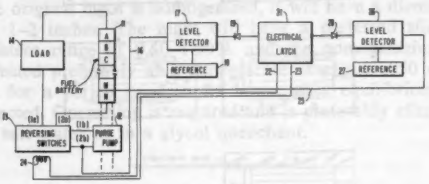
**3,600,229**

**FUEL CELL AUTOMATIC PURGE SYSTEM PROVIDING RELIABLE INITIATION AND TERMINATION OF PURGING**

**Robert A. Torkildsen, Danvers, Mass., assignor to General Electric Company**

**Filed Nov. 29, 1968, Ser. No. 779,920**
**Int. Cl. H01m** *27/12*
**U.S. Cl. 136—86** **6 Claims**




A combined sensing and output power actuating control system for power generation assemblies of the fluid consuming cell type such as fuel cells and fuel batteries. The control system is designed to sense or detect build-up of undesired inert gaseous matter in the consumable and regenerable fluid supply system of such assemblies by sensing the need for purging of the consumable and regenerable fluid supply system. After some predetermined safe period of purging, the assembly will indicate the need for termination of the purging operation. A signal is then generated in response to the reduction in the inert concentration to actuate the purge control circuitry and terminate the purging operation.

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**3,600,230**

**GAS-DEPOLARIZED CELL WITH HYDROPHOBIC-RESIN-CONTAINING CATHODE**

**Zbigniew Stachurski, New York, N.Y., and Renato Di Pasquale, Paramus, N.J., assignors to Yardney International Corp., New York, N.Y.**

**Continuation of application Ser. No. 524,927, Feb. 3, 1966. This application Sept. 22, 1969, Ser. No. 860,098**
**Int. Cl. H01m** *29/04, 13/00*
**U.S. Cl. 136—86** **8 Claims**

A gas electrode for use in a gas-depolarizable current-generating cell comprises a unitary structure formed of (1) a conductive apertured current-collecting member, i.e. a metallic grid or screen, (2) a porous conductive layer consisting of a hydrophobic resinous material and a network of conductive material in fibrous form in intimate contact with one surface of the apertured current-collecting member, and (3) a porous catalytically active layer, consisting of a hydrophobic resinous material containing particles of catalytically active material dispersed therein, in intimate contact with the outer surface of the hydrophobic conductive layer.

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**3,600,231**

**MERCURY CELL**

**Robert J. Dawson, Madison, Wis., assignor to ESB Incorporated**

**No Drawing. Filed Nov. 28, 1969, Ser. No. 880,947**
**Int. Cl. H01m** *15/06*
**U.S. Cl. 136—111** **6 Claims**

A mercury cell is described having additives in the mercuric depolarizer mix which have the effect of stabilizing the open circuit voltage and inhibiting agglomeration of mercury in the depolarizer mix. The preferred additive is $Mn_2O_3$ although $Mn_3O_4$ has been found to be satisfactory. The additive is mixed with the depolarizer mix in amounts ranging from at least about 1% by weight of the mix to a maximum percentage consistent with capacity and volume requirements.

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**3,600,232**

**ELECTRICAL STORAGE BATTERY**

**Henri Daguenet, Le Mans, France, assignor to Societe Industrielle des Comprimes de l'Ouest**

**Filed Jan. 27, 1969, Ser. No. 793,936**
**Claims priority, application France, Jan. 25, 1968, 137,354**
**Int. Cl. H01m** *35/32*
**U.S. Cl. 136—134** **6 Claims**

The battery comprises a plurality of cells separated by tight partitions each including plates connected at their tops by a plate bridge, the electrical connection between bridges of adjacent cells being effected by means of a conducting member embedded in an insulating part sealingly engaged in a slot provided in the top edge of the partition between said adjacent cells. The conducting member has its lateral faces welded to the vertical faces of the plate bridge portions that are adjacent to said lateral faces. Each of the lateral faces of the conducting member is surrounded by a closed rib having a constant height integrally molded with said insulating part, the shape of said closed rib being such that it is adapted to engage without any discontinuity the portion of plate bridge adjacent thereto.

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**3,600,233**

**BLOW MOLDED BATTERY CONTAINER AND INDIVIDUAL BLOW MOLDED CELL MODULES HOUSED THEREIN**

**James P. Coffey, Hatboro, Pa., James W. Consolloy, Pennington, N.J., and Frank A. Vengrofski, Rockledge, Pa., assignors to ESB Incorporated**

**Filed Sept. 12, 1969, Ser. No. 857,319**
**Int. Cl. H01m** *35/32*
**U.S. Cl. 136—134R** **8 Claims**

A battery comprising blow molded battery cell modules is disclosed wherein external intercell connectors are provided for interconnecting the individual modules. The modules are housed in a blow molded battery container which has a manifold venting arrangement.

3,600,234

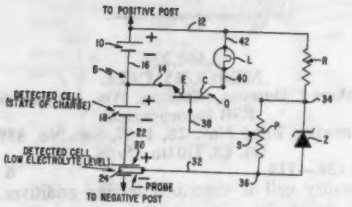
## ELECTRONIC BATTERY CONDITION INDICATOR

Marion D. Massie, Jr., Toledo, Ohio, assignor to Eltra Corporation, Toledo, Ohio

Continuation of application Ser. No. 649,230, June 27, 1967. This application Jan. 9, 1970, Ser. No. 3,567

Int. Cl. H01m *31/04, 45/06*

U.S. Cl. 136—182 3 Claims




Indicator for battery conditions showing the state of charge by a voltage comparison means, and electrolyte level in a cell by the use of a probe.

3,600,235

## METHOD FOR MANUFACTURING SEMICONDUCTOR DEVICE

Tomisaburo Okumura, Kyoto, Japan, assignor to Matsushita Electronics Corporation, Osaka, Japan

Filed June 2, 1969, Ser. No. 829,390

Claims priority, application Japan, June 5, 1968, 43/39,251

Int. Cl. H01l *7/34*

U.S. Cl. 148—187 4 Claims

A manufacturing method of a semiconductor device having a source and drain doped opposite conduction type to the substrate and a gate on an insulator film coated on a surface portion of the semiconductor substrate between both doped regions; forming a doped layer preliminarily on the whole surface of substrate, etching these layers so as to form the source and drain regions, and forming a gate insulator film on the portions where the doped layers are removed by etching, thereby forming the gate electrode on these portions. By these steps a semiconductor device having a high mutual conductance and a low input electric capacitance can be obtained. This method is applicable to the manufacture of active elements such as transistors and further integrated circuit element.

3,600,236

## METHOD OF OBTAINING TYPE CONVERSION IN CdS

James A. Marley, Jr., Needham, Mass., assignor to Corning Glass Works, Corning, N.Y.

Filed May 13, 1969, Ser. No. 824,035

Int. Cl. H01l *7/34*

U.S. Cl. 148—1.5 10 Claims

A method of making p-n junction devices by bombarding a polished crystal of cadmium sulfide with ions of an element selected from the group V–A elements. When the crystal is held at an elevated temperature during the ion bombardment step, subsequent annealing is usually not necessary. When the crystal temperature is at room temperature or below during the ion bombardment step, type conversion can be obtained only by post implantation annealing.

3,600,237

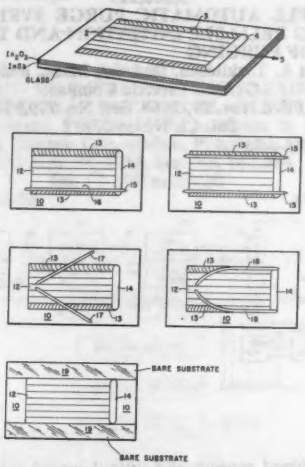
## CONTROLLED NUCLEATION IN ZONE RECRYSTALLIZED InSb FILMS

Neil M. Davis and Arthur R. Clawson, Riverside, Calif., assignors to the United States of America as represented by the Secretary of the Navy

Filed Dec. 17, 1969, Ser. No. 885,923

Int. Cl. B01j *17/08*

U.S. Cl. 148—1.6 8 Claims




Growth of zone recrystallized films without edge nucleation; a technique by which thin semiconducting InSb films and other materials can be crystallized from the melt with selected crystallographic orientation, allowing processing of more homogeneous and higher quality films for a wide variety of transducers based on the Hall effect and magnetoresistance phenomena.

3,600,238

## METHOD OF MANUFACTURING A COMPOSITE PART

Raymond Ravenel, Sceaux, France, assignor to Societe Anonyme Andre Citroen, Paris, France

Filed June 18, 1968, Ser. No. 737,992

Claims priority, application France, June 30, 1967, 112,603

Int. Cl. B22d *25/00*; C21d *5/00*

U.S. Cl. 148—3 7 Claims

A method of manufacturing composite bodies comprising making a first part from cast iron containing spheroidal graphite and a second part from self-hardening cast iron, casting one of the parts in or on the other part and applying heat to the combination of the two parts.

3,600,239

## METHOD OF USING AND FOR FABRICATING ULTRASONIC BONDING GRADE ALUMINUM WIRE AND RESULTING PRODUCT

Raymond Abbott De Forest, New City, and Robert Linus Moore, Monsey, N.Y., assignors to Secon Metals Corporation, White Plains, N.Y.

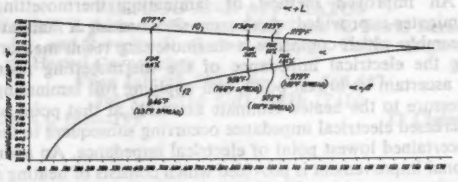
Filed Nov. 26, 1968, Ser. No. 778,923

Int. Cl. C22c *21/02*; C22f *1/04*

U.S. Cl. 148—11.5A 13 Claims

In accordance with the invention there is provided a method which permits ultrasonically bonding silicon aluminum wire to transistors with improved effectiveness by

preparing the silicon aluminum wire with a silicon content of about 1% with an improved method, the method more particularly comprising homogenizing a silicon aluminum material at an elevated temperature, followed by a quenching of the metal. There may be a subsequent forming of a wire from the metal or the wire may be previously formed in part or in entirety. Preferably, if



the original ingot is homogenized, it will have a diameter of 1–2 inches. The ingot will have a preferred silicon content range of 0.50–1.50% and the homogenizing is effected preferably at a temperature of about 1050 deg. F. for a period of 1 to 24 hours after equilibrium is effected. Quenching is required and is preferably effected in salt water or in a glycol quenchant.

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**3,600,240**

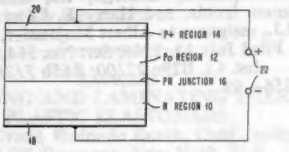
## EPITAXIAL GROWTH FROM SOLUTION WITH AMPHOTERIC DOPANT

**Hans S. Rupprecht, Yorktown Heights, and Jerry M. Woodall, Putnam Valley, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Original application July 15, 1966, Ser. No. 565,440. Divided and this application Dec. 12, 1968, Ser. No. 798,537**

**Int. Cl. H01l *7/38***

**U.S. Cl. 148—171** **13 Claims**




P-type gallium arsenide is grown epitaxially from solution in gallium on the surface of N-type gallium arsenide, with silicon as dopant on both sides of the junction. A recombination radiation device is made by the method.

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**3,600,241**

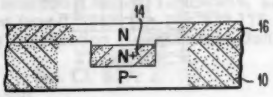
## METHOD OF FABRICATING SEMICONDUCTOR DEVICES BY DIFFUSION

**Ven Y. Doo, Poughkeepsie, and Andrea Spiro, Pleasant Valley, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Filed Sept. 9, 1968, Ser. No. 758,236**

**Int. Cl. H01l *7/00, 7/36;* C23c *11/00***

**U.S. Cl. 148—175** **5 Claims**




In semiconductor device fabrication, after diffusion has been carried out at elevated temperatures through a $SiO_2$ or other diffusion barrier masks, the mask is stripped from the surface of the semiconductor substrate, and the surface of the semiconductor substrate is reoxidized. This eliminates surface defects in the semiconductor substrate which tend to arise at the elevated temperatures over relatively long periods of time necessary for diffusion. Where an epitaxial layer is to be formed on the surface of the substrate, the oxide layer is first removed from the surface. This reduces stacking faults in the epitaxial layer caused by the surface irregularities in the substrate.

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**3,600,242**

## PROCESS FOR FORMING ELECTRICALLY STABLE DOPED EPITAXIAL LAYERS

**Melvin Berkenblit and Arnold Reisman, Yorktown Heights, and Thomas B. Light, Chappaqua, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Filed Oct. 3, 1968, Ser. No. 764,863**

**Int. Cl. H01l *7/36;* H01b *13/06***

**U.S. Cl. 148—175** **13 Claims**

A process which stabilizes the resistivity of an epitaxially grown layer of germanium doped with p-type impurities and deposited in a low temperature open tube disproportionation system from a germanium halide specie under surface limited condition is disclosed. When p-type dopants are deposited along with germanium in a surface limited node, heating subsequent to deposition to higher temperatures than the deposition temperature brought about changes in resistivity resulting in inoperable devices or devices having poor characteristics. The resistivity changes can be overcome by a post-deposition anneal alone or by adjusting deposition parameters, such as growth rate and substrate temperature in conjunction with annealing.

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**3,600,243**

## METHOD OF MAKING CHROMIUM MASK FOR PHOTORESIST APPLICATION

**Armand P. La Rocque, New Shrewsbury, and Alex Rogel, Red Bank, N.J., assignors to the United States of America as represented by the Secretary of the Army**

**No Drawing. Original application Nov. 9, 1966, Ser. No. 593,603. Divided and this application Feb. 26, 1969, Ser. No. 819,505**

**Int. Cl. B32b *31/14;* B44c *1/22;* C23f *1/00***

**U.S. Cl. 156—3** **1 Claim**

A durable and adherent film of chromium of about 2000 to about 4500 angstroms in thickness is first vacuum deposited onto a glass substrate. A durable chromium mask suitable for photoresist applications is then made by coating the chromium film with photoresist, air drying the photoresist covered chromium film and then prebaking the covered film at 100 to 120 degrees C. for at least 15 minutes, placing a photographic transparency having the desired pattern over the photoresist film, exposing the film to ultraviolet light, developing and then finally baking the photoresist at 100 to 120 degrees C. for 5 to 15 minutes, etching the chromium film in the areas void of photoresist in a solution of about 1 to 3 grams of zinc metal in about 20 to 50 cc. of concentrated hydrochloric acid, and heating the film to about 400 degrees C. after pattern etching.

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**3,600,244**

## PROCESS OF ETCHING METAL WITH RECOVERY OR REGENERATION AND RECYCLING

**Herbert Wegener, Endicott, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.**

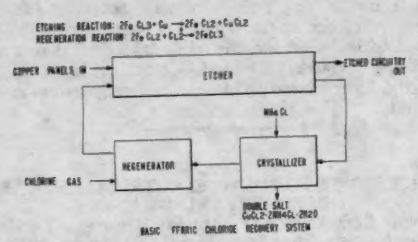
**Filed Feb. 20, 1969, Ser. No. 800,979**

**Int. Cl. C23g *1/36;* C23f *17/00;* H05k *3/06***

**U.S. Cl. 156—19** **9 Claims**

This invention refers to a process whereby the reaction products of etching copper, cobalt, iron, nickel, zinc, or magnesium with cupric chloride or ferric chloride are

precipitated as a double salt of the dissolved metal chloride and ammonium chloride by cooling the solution. The double salt is separated from the remaining solution, the




etching solution is recovered and regenerated by the use of an oxidant such as chlorine, muriatic acid and hydrogen peroxide, muriatic acid and air, or muriatic acid and oxygen.

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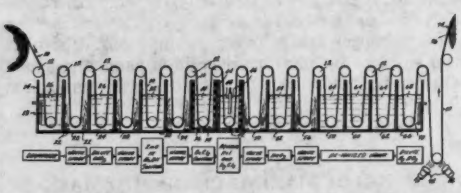
**3,600,245**
**ALUMINUM ETCH PROCESS**
**Howard W. Gates, 3624 Sierra Vista Ave., Glendale, Calif. 91208**
**Filed Mar. 6, 1968, Ser. No. 711,040**
**Int. Cl. C23g *1/22*; C23f *1/00***
**U.S. Cl. 156—22** **8 Claims**



A process for increasing the surface area of aluminum wherein a galvanic couple is formed between a surface of the aluminum and an overcoating of a metal that is more electronegative that zinc; the overcoating is acid-washed to finely etch the aluminum surface. In a specific example, zinc is first deposited on the surface of high purity aluminum foil, from a solution of zinc oxide in sodium hydroxide. Copper is then deposited from an aqueous solution of cupric chloride. The resultant surface is acid-washed with aqueous hydrochloric acid containing a catalytic amount of ferric chloride, followed by a nitric acid bath.

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**3,600,246**
**METHOD OF MAKING LAMINATED SEMICONDUCTOR DEVICES**
**Joseph Breen, Somerville, N.J., assignor to RCA Corporation**
**Filed May 17, 1968, Ser. No. 730,045**
**Int. Cl. G01r *27/00***
**U.S. Cl. 156—64** **4 Claims**

In the fabrication of semiconductor devices, a surface of a semiconductor wafer, containing a plurality of individual semiconductor components, is provided with a paste-like, viscous layer of a bonding cement, such as an epoxy resin. The paste-like material is rendered relatively hard and non-viscous, for the purpose of facilitating further handling of the wafer, and the wafer, after such further handling, is cracked to provide individual pellets, each having a surface of non-viscous bonding cement. The bonding cement is then resoftened to a paste-like, adhesive state, and the bonding cement layer is engaged with a support member to which the pellet is to be bonded. The assembly is heated to cure the bonding cement to form a rigid bond between the pellet and the support member.

**3,600,247**
**METHOD OF LAMINATING EMPLOYING MEASURING THE ELECTRICAL IMPEDANCE OF A THERMOSETTING RESIN**
**Rudolph J. Armstrong, Jr., Hempstead, N.Y., assignor to Photocircuits Corporation, Glen Cove, N.Y.**
**No Drawing. Continuation-in-part of application Ser. No. 680,983, Nov. 6, 1967. This application Apr. 24, 1969, Ser. No. 819,093**
**Int. Cl. G01r *5/00***
**U.S. Cl. 156—64** **14 Claims**

An improved method of laminating thermosetting laminates is provided which comprises heating a laminate assembly which comprises a thermosetting resin, measuring the electrical impedance of the thermosetting resin to ascertain its lowest point, and applying full laminating pressure to the heated laminate assembly at that point of increased electrical impedance occurring subsequent to the ascertained lowest point of electrical impedance. An additional improvement is provided which consists of heating a laminate assembly which comprises a thermosetting resin, measuring the electric current generated by heating the thermosetting resin to ascertain its highest point and applying full laminating pressure to the heated assembly at that point of decreased generation of electric current occurring subsequent to the ascertained highest point of electric current.

Furthermore, an improved press is provided which is adapted with electrical sensing means to determine the gel stage of the thermosetting resin of a heated thermosetting laminate assembly. Lastly, an improved process of preparing multilayer circuit laminates is provided which comprises treating the surface of a fully cured laminate circuit layer having printed, metallic circuit pattern surfaces with a laminating adhesive resin prior to lamination.

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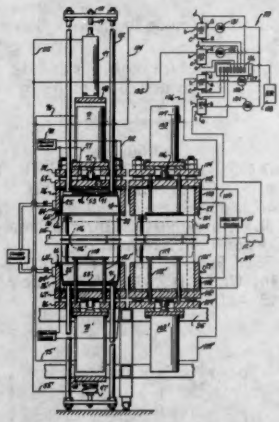
**3,600,248**
**METHOD FOR HEAT SEALING THERMOPLASTIC BODIES**
**Albert B. Mojonnier, Chicago, Ill., and Gilbert M. Schlussman, Ironia, and Harry E. Lowe III, Martinsville, N.J., assignors to Albert Mojonnier, Inc.**
**Filed July 13, 1966, Ser. No. 564,842**
**Int. Cl. B29c *27/00*; B65b *7/28***
**U.S. Cl. 156—69** **6 Claims**



A method of joining two thermoplastic polyethylene bodies having overlapping portions, in which the overlapping portions are heat softened by engaging and disengag-

ing the same at least twice in succession between heating jaws heated to a preferably high temperature in the range 500°–1000° F., and the heat softened overlapping portions are thereafter cooled by engaging the same between cool sealing jaws with sufficient pressure to bring the overlapping portions into intimate contact.

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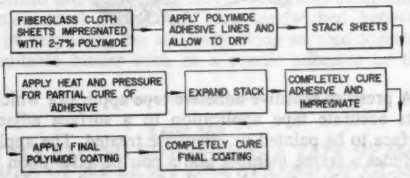
**3,600,249**
**REINFORCED PLASTIC HONEYCOMB METHOD AND APPARATUS**
**Wendell T. Jackson, Pleasant Hill, John A. Stark, Berkeley, and Beverley R. Garrett, Moraga, Calif., assignors to Hexcel Corporation**
**Filed July 28, 1966, Ser. No. 568,647**
**Int. Cl. B31d *3/02*; B32b *17/10***
**U.S. Cl. 156—197** **12 Claims**


FIBERGLASS CLOTH SHEETS IMPREGNATED WITH 2-7% POLYIMIDE
APPLY POLYIMIDE ADHESIVE LINES AND ALLOW TO DRY
STACK SHEETS
APPLY HEAT AND PRESSURE FOR PARTIAL CURE OF ADHESIVE
EXPAND STACK
COMPLETELY CURE ADHESIVE AND IMPREGNATE
APPLY FINAL POLYIMIDE COATING
COMPLETELY CURE FINAL COATING

A method and apparatus for constructing honeycomb from a fabric which tends to distort under its own weight. The fabric is impregnated with a slight amount of a resin impregnation material to give it sufficient body, preventing its distortion while allowing it to be flexibly deformed during expansion of the honeycomb. After the impregnation of the fabric, adhesive lines are applied thereto. Strips of the fabric are then stacked and subjected to heat to cure the adhesive and the stacks are expanded to give them the honeycomb configuration. Thereafter the impregnation material and adhesives are further cured and coated to rigidify the structure.

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**3,600,250**
**STRETCHING AND LAMINATING THERMOPLASTIC ELASTOMERS**
**Anthony C. Evans, Redondo Beach, Calif., assignor to Shell Oil Company, New York, N.Y.**
**Filed Sept. 12, 1968, Ser. No. 759,365**
**Int. Cl. B32b *31/00***
**U.S. Cl. 156—229** **2 Claims**

A process is provided for the production of thin films of thermoplastic elastomers comprising hot drawing and cold elastic elongation of an extruded film followed by hot lamination with a substrate. An apparatus is provided for carrying out this process which inherently involves high speed lamination and, if desired, very thin films due to the high cold stretchability possible with thermoplastic elastomers.

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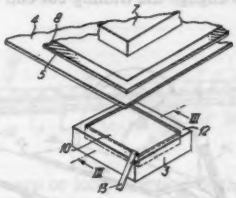
**3,600,251**
**APPARATUS FOR APPLYING AN ELECTRIC ARC BETWEEN ELECTRICALLY CONDUCTING ELEMENTS AND A CONDUCTIVE STRIPE ON GLASS**
**Roy Singleton, Eccleston, St. Helens, England, assignor to Pilkington Brothers Limited, Lancashire, England**
**Filed June 2, 1969, Ser. No. 829,175**
**Claims priority, application Great Britain, June 7, 1968, 27,291/68**
**Int. Cl. B29c *27/04***
**U.S. Cl. 156—380** **8 Claims**

Apparatus for applying electric current to a conducting stripe on glass, includes means for supporting the glass and electrically conductive elements, each with an extended arcing face, positioned relative to said supporting means so as to lie adjacent parts of the stripe to which electrical connection is to be made, whereby on connecting said elements to a current source an electric arc strikes between said arcing face of each element and the conductive stripe on the glass.



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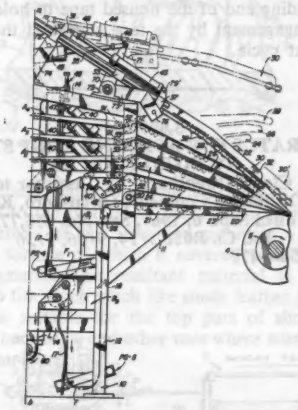
**3,600,252**
**MULTIPLE-STATION SERVICING ASSEMBLY FOR TIRE BUILDING OPERATIONS**
**Virgil Estill Henley and Martin Nesbitt Robertson, Akron, Ohio, assignors to The General Tire & Rubber Company**
**Filed Apr. 24, 1969, Ser. No. 818,890**
**Int. Cl. B29h *17/20***
**U.S. Cl. 156—406** **8 Claims**



A servicer for a tire building drum, complete with carcass stock supply rolls and guides, is provided with a vertically aligned series of servicing trays at one end of the main frame. A selected number of these trays, which all extend from one end of the servicer, are pivotable into and out of respective servicing positions. The pivotable trays can only be pivoted according to a prescribed building sequence. All but the uppermost tray are operatively associated with stock storage and supply systems also carried by the frame. The top or uppermost tray is adapted to store and ultimately present to the builder the normally extruded piece of elastomeric material, which represents the tread or tread and sidewall portion of the tire, to complete the tire building sequence.

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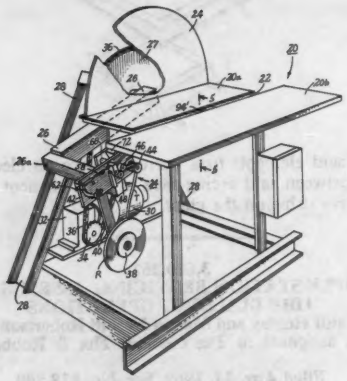
**3,600,253**
**APPARATUS FOR APPLYING ADHESIVE TAPE AROUND PACKAGES**
**Jerome W. Derenthal, Succasunna, N.J., assignor to Stapling Machines Co., Rockaway, N.J.**
**Filed Sept. 17, 1968, Ser. No. 760,145**
**Int. Cl. B65b *13/10***
**U.S. Cl. 156—468** **7 Claims**

A machine for applying adhesive tape around a package which includes a tape starter for pressing the leading end

of the tape against the package, a tape supply assembly rotatable around the package, a tape cutter to sever the tape after one revolution of the tape supply assembly, a tape presser to engage the trailing cut end of the tape and



press it against the package, and a tape holder for engaging the leading end of the unused tape to hold it in position for engagement by the tape starter at the beginning of the next cycle.

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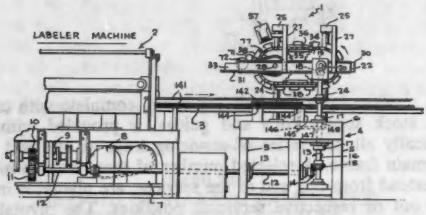
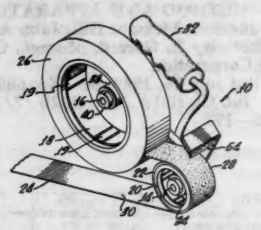
**3,600,254**
**APPARATUS FOR AFFIXING STRIP STAMPS TO BOTTLE NECKS**
**Robert A. Clark, Owensboro, Ky., assignor to Glenmore Distilleries Company, Owensboro, Ky.**
**Filed Sept. 6, 1967, Ser. No. 665,773**
**Int. Cl. B65c** *3/14, 9/06, 9/36*
**U.S. Cl. 156—477** **14 Claims**




An attachment for a labeler machine to apply strip stamps to bottles which is mounted for operation over bottles in predetermined orientation exiting from the labeler machine, that includes a plurality of stamp applying heads mounted for travel in an orbital path to a stamp magazine to pick up stamps, a glue applying station where the stamps receive adhesive and along a stamp applying path where the heads travel in unison with oriented bottles. Each head has a plunger to press the center of a stamp against the top of a bottle, and yieldingly hold it there, while compressible jaws move downwardly and inwardly to stretch the stamp ends along the sides of a bottle neck, and press them against the neck sides, into the radius between the neck and shoulders, and firmly onto the bottle shoulders, the pressure movement of the jaws being controlled by contact of the jaws with the plunger.

**3,600,255**
**PRESSURE SENSITIVE ADHESIVE TAPE APPLICATOR**
**Schubert W. Hinds, 601 Lovell Place, Fullerton, Calif. 92632**
**Filed Apr. 26, 1968, Ser. No. 724,511**
**Int. Cl. B32b** *31/18, 31/20*
**U.S. Cl. 156—527** **2 Claims**



A pressure-sensitive adhesive tape applicator which permits accurate tape application to a surface adjacent a surface to be painted or otherwise treated. The applicator includes a frame member and a pair of axles upon which are rotatably mounted a roll of tape and a guide roller for applying the tape to the surface to be taped. The frame member is attached to said axles on one side leaving the other side unobstructed so that the tape may be applied close to the incline of the surface. A frame handle is attached to said frame intermediate said axles to roll said tape onto said surface as it is played out from said tape roll.

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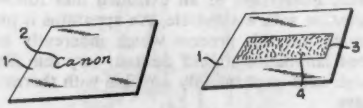
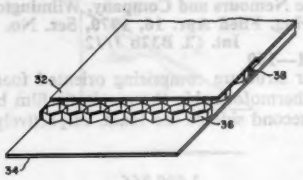
**3,600,256**
**HOT STAMPING LEAF FOR CONCEALING INDICIA AND METHOD OF USING**
**Umi Tosaka, Tokyo, Yozo Sano, Fujisawa-shi, Takehiko Matsuo, Tokyo, Hirokazu Negishi, Yokohama-shi, Tamao Ikuta, Fujisawa-shi and Masaru Yamaguchi and Setsuko Hattori, Tokyo, Japan, assignors to Canon Camera Kabushiki Kaisha, Tokyo, Japan**
**Filed Apr. 18, 1968, Ser. No. 722,237**
**Claims priority, application Japan, Apr. 22, 1967, 42/33,453, 42/33,454; May 12, 1967, 42/39,202; Jan. 27, 1968, 43/4,595**
**Int. Cl. B44f** *1/04*
**U.S. Cl. 161—3.5** **16 Claims**



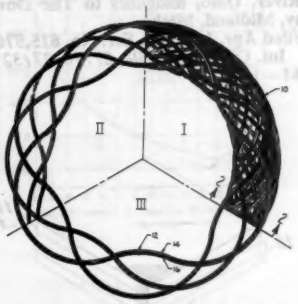

A hot stamping leaf for concealing letters and signs which comprises a base film and a colored coating layer containing a material which near infrared ray and infrared ray can pass through, but visible ray cannot pass through. The colored coating layer may be mainly made of polyvinyl butyral resin and, if desired, another resin having average molecular weight of less than 10,000. The hot stamping leaf may have unevenness on the surface. Further, two ends of the hot stamping leaf may be inserted to two cuts provided on a base paper at a certain interval, respectively. The hot stamping leaf may be composed of a thermosensitive adhesive layer, a colored coating layer and a peelable layer successively provided on a base film.

3,600,257
**LIGHTWEIGHT MIRROR STRUCTURES**
Frederick A. Reinhardt, Severna Park, Md., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.
Filed Jan. 9, 1969, Ser. No. 789,984
Int. Cl. G02b *5/08*; B32b *3/12*; B21d *47/00*
U.S. Cl. 161—4 1 Claim




Described are lightweight mirror structures comprising a stainless steel honeycomb core sandwiched between sheets of beryllium, the assembly being secured together by a suitable binder such as a plastic adhesive or the like.

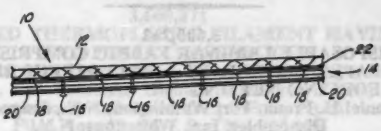
3,600,258
**FRICTION FACING COMPRISING A TAPE OF MATERIAL OF AT LEAST ONE STRAND OF GLASS YARN AND AT LEAST ONE STRAND OF ASBESTOS YARN IN SIDE-BY-SIDE RELATIONSHIP**
Henry C. Morton, East Greenbush, N.Y., assignor to The Bendix Corporation
Filed Mar. 25, 1969, Ser. No. 810,277
Int. Cl. B32b *5/08*, *5/26*
U.S. Cl. 161—42 15 Claims




A friction facing for clutches and the like is disclosed which incorporates at least one yarn of filamentary glass fibers in the friction material prior to final fabrication to improve the burst strength of the friction facing. Additionally, bundles of filamentary treated glass fibers may be added to the facing at the I.D. and/or at the O.D. to further improve the hot burst strength of the friction facing.

3,600,259
**HEAT FUSIBLE BACKING FABRICS AND LAMINATED FABRICS MADE THEREFROM**
Delmont K. Smith, Long Meadow, Mass., and John A. Mortensen, Cranford, N.J., assignors to Johnson & Johnson
Filed Jan. 14, 1969, Ser. No. 792,222
Int. Cl. B32b *7/08*
U.S. Cl. 161—51 9 Claims

A laminated fabric having excellent drape, a full body and good bulk comprising (1) a facing fabric having desired visual and tactile properties, especially softness and smooth hand and (2) a backing fabric comprising a layer of fibrous materials stitch-bonded together in an area pattern of stitched warp thread loops normally proceeding

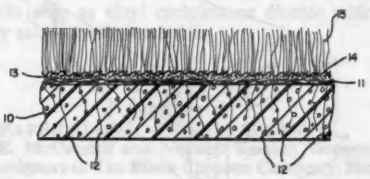



generally in the warp or long direction of the fabric, said facing fabric and said backing fabric being adhesively secured together.

3,600,260
**ARTIFICIAL LEATHER OR SUEDE-LIKE MATERIAL**
Tatsuo Watanabe, 162 3-chome, Tamagawa-Okuzawa-machi, Setagaya-ku, Tokyo, Japan
Filed Feb. 2, 1967, Ser. No. 613,490
Claims priority, application Japan, June 1, 1966, 41/51,161
Int. Cl. B32b *27/12*; D04h *11/00*
U.S. Cl. 161—62 1 Claim

This invention relates to synthetic leather or suede-like material and to the method of manufacturing said material. The method of this invention produces a synthetic leather, one surface of which is covered with thin wavy hair-like filaments. The resultant material is soft and also warm to the touch much like suede leather or (buckskin), and is suitable for the top part of shoes or as material for handbags, and other uses where suede leather is usually employed.

3,600,261
**FLAME RETARDING BACKING FOR INFLAMMABLE WEBS**
Bruno Kerres, Grefrath, Germany, assignor to Girmes-Werke AG, Krefeld, Germany
Filed Dec. 26, 1968, Ser. No. 787,001
Claims priority, application Germany, Sept. 18, 1968, G 40,356
Int. Cl. B32b *5/08*, *5/18*; D05c *17/12*
U.S. Cl. 161—64 11 Claims




A backing of material having flame retardant properties is disclosed. The new backing material includes a foamed material having a fleece layer composed of non-inflammable fibers joined to one side by needle looming.

The fleece covered surface of the foamed material can be attached to the back of an inflammable web, such as plush and velour fabrics to render them sufficiently resistant to fire as to be readily marketable.

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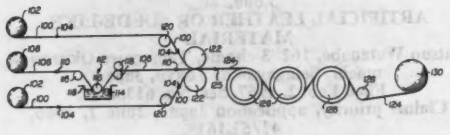
3,600,262
**DISPOSABLE LAMINAR FABRIC COMPRISING PAPER BONDED TO A POLYOLEFIN REINFORCING NETTING**
Daniel H. Frank, Port Washington, N.Y., assignor to Disposables, Inc., Whitestone, N.Y.
Filed Mar. 12, 1969, Ser. No. 806,480
Int. Cl. B32b 27/10
U.S. Cl. 161—79 3 Claims



A disposable fabric comprising paper bonded to a plastic reinforcing web which is integrally extruded and has elongation characteristics similar to those of the paper.

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3,600,263
**METAL CLAD LAMINATES**
Theodore W. Lapitz, Jr., La Crosse, Wis., assignor to Universal Oil Products Company, Des Plaines, Ill.
No Drawing Filed Aug. 13, 1969, Ser. No. 849,884
Int. Cl. B32b 15/08; H05k 1/00
U.S. Cl. 161—93 6 Claims

Metal clad laminate prepared by heat pressing (1) a "B" stage insulate comprising epoxy resin bonded to a filler in a dicyandiamide-benzyldimethylamine curing system and (2) metal component with (3) a thin film of thermoplastic polymeric composition disposed between said insulate and said metal component.

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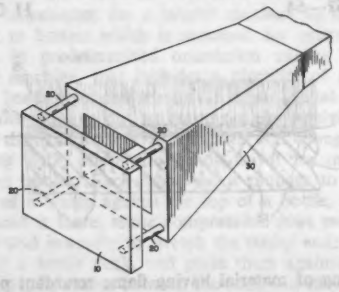
3,600,264
**STRUCTURAL LAMINATE**
Warren D. Williams, Dallas, Tex., assignor to the United States of America as represented by the Secretary of the Army
Filed Oct. 1, 1969, Ser. No. 862,732
Int. Cl. B32b 17/02, 17/10
U.S. Cl. 161—140 2 Claims



A structural laminate for use in radomes and feed horn antennas. The laminate is made up of a plurality of fiber glass mats that are bonded together with a resin mixture that has dielectric material dispersed therein to produce a structure with a desired dielectric constant and loss tangent.

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3,600,265
**ORIENTED FOAM LAMINAR STRUCTURES**
Leon Edward Wolinski, Buffalo, N.Y., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.
No Drawing. Filed Apr. 16, 1970, Ser. No. 29,234
Int. Cl. B32b 3/12
U.S. Cl. 161—160 5 Claims

A laminar structure comprising oriented foam having paper and thermoformable thermoplastic film bonded to a first and second side of the foam, respectively.

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3,600,266
**COLOR STABILIZED POLYVINYL CHLORIDE POLYURETHANE COMPOSITIONS**
Elwood E. Huntzinger, Springfield, Pa., assignor to Air Products and Chemicals, Inc., Philadelphia, Pa.
No Drawing. Filed June 26, 1968, Ser. No. 740,029
Int. Cl. B32b 5/18
U.S. Cl. 161—160 6 Claims

Plastic products wherein a tertiary amine catalyzed semi-rigid polyurethane foam juxtaposes a layer of non-porous polyvinyl chloride are safeguarded against staining of the polyvinyl chloride layer by the incorporation in the polyurethane of a slightly volatile halogen-containing compound which may be added in an appropriate adjuvant. Additionally, methods of making such foams and precursor compositions for the foams are disclosed.

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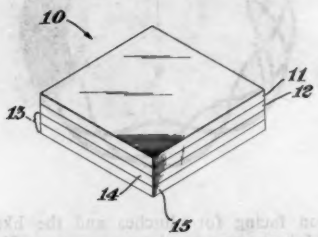
3,600,267
**PACKAGING FILM**
Robert McFedries, Jr., Bay Village, and Don W. Seidler, Rocky River, Ohio, assignors to The Dow Chemical Company, Midland, Mich.
Filed Apr. 14, 1969, Ser. No. 815,576
Int. Cl. B32b 27/08, 27/10, 27/32
U.S. Cl. 161—165 5 Claims




A packaging film having improved machineability by virtue of a lower heat seal temperature, wider sealing range and good seal strength wherein the heat seal layer comprises polyethylene homopolymer and an ethylene-vinyl acetate copolymer.

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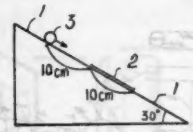
3,600,268
**SURFACE PROTECTING SHEET**
Yutaka Hori, Zenzo Honda, and Yoichi Nomura, Ibaraki, Japan, assignors to Nitto Electric Industrial Co., Ltd., Ibaraki, Japan
Filed Nov. 17, 1967, Ser. No. 683,958
Int. Cl. C09j 7/02
U.S. Cl. 161—167 7 Claims

A surface protecting sheet according to the invention comprises a flexible plastic sheet (polyvinyl chloride, etc.) of a thickness of 0.20 to 0.02 mm. and a cured acrylic rubber layer not over 0.05 mm. thick on one surface

thereof, said rubber layer being made by cross-linking a synthetic rubber consisting mainly of acrylic ester. A layer of low frictional resistance is preferably provided on the other surface of the flexible plastic sheet. The sheet is useful in protecting the surface of a plate, sheet, etc. of metal or the like while affording a view of such surface.




The present sheet has high resistance to light and weather, does not tend to adhere to the protected surface when removed therefrom, and is sufficiently strong to resist pressures applied to the metal sheet or the like during deep drawing, press-binding, roll forming, etc., without tear or damage.

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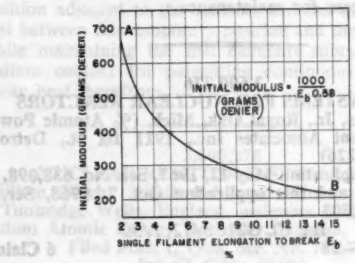
**3,600,269**
**NOVEL FIBER REINFORCED MATRIX COMPOSITES**

**Brian K. Daniels, Jack Preston, and David A. Zaukelies, Raleigh, N.C., assignors to Monsanto Company, St. Louis, Mo.**

**Filed July 29, 1968, Ser. No. 748,559**
**Int. Cl. B32b** *27/02, 27/12, 27/34*
**U.S. Cl. 161—170** **26 Claims**




Resinous and ceramic shaped structures have been reinforced with high temperature organic fibers having densities greater than 1.37 g./ml. and unusually high initial moduli of over 700 grams per denier at elongations of 2 percent or greater. The reinforcing fiber elements are made from wholly aromatic polymers having melting points above 200° C. and inherent viscosities of at least 3.5. The fiber reinforced composites are used for shaped structures having modulus/unit weight properties superior to those of comparable glass reinforced structures.

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**3,600,270**
**TRANSPARENT PAPER FOR PHOTOGRAPHIC PURPOSES**

**Gregor Kemme, Osnabruck, Germany, assignor to Felix Schoeller, Jr., Osnabruck, Germany**

**No Drawing. Filed Sept. 25, 1967, Ser. No. 670,392**
**Claims priority, application Germany, Sept. 27, 1966, Sch 39,582**
**Int. Cl. G03c** *1/80*
**U.S. Cl. 161—251** **3 Claims**

A transparent and preferably waterproofed photographic paper made up of a plurality of layers, the basis of which is highly transparent cellulose paper layers bonded together by an ionomer.

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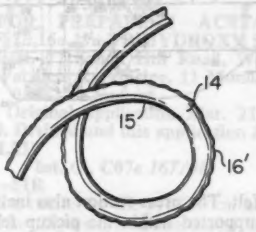
**3,600,271**
**CRIMPED THERMOPLASTIC FILAMENT HAVING A TWO PHASE CROSS-SECTION**

**Terumichi Ono, Tsuneo Haga, Yasuo Takagi, Nagoya-shi, Japan, and Tomitake Higuchi, Aichi-ken, Japan, assignors to Toray Industries, Inc., Tokyo, Japan**

**Filed Nov. 28, 1967, Ser. No. 686,136**
**Claims priority, application Japan, Dec. 9, 1966, 41/80,308; June 30, 1967, 42/41,749, 42/41,750, 42/41,751, 42/41,753**
**Int. Cl. D02g** *1/10*
**U.S. Cl. 161—173** **11 Claims**




An improved crimped filament of thermoplastic synthetic high polymer of the invention is composed of nonconjugated structure having two different phases in cross section of said filament. The above-mentioned two different phases in cross section of the filament is defined by the difference in dyeability or refraction index. The crimped filament of the invention is provided with the outside roughened surface having numerous fine pit-like portions. The process for manufacturing the crimped fiber of the invention is also disclosed.

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**3,600,272**
**POLYETHYLENEIMINE CURED EPOXY-MODIFIED PAPER**

**Louis R. Cortigene, Portland, and William R. Sherman, Cape Elizabeth, Maine, assignors to Scott Paper Company, Delaware County, Pa.**

**No Drawing. Filed Aug. 29, 1968, Ser. No. 756,312**
**Int. Cl. D21d** *3/00;* **D21h** *3/36*
**U.S. Cl. 162—164** **13 Claims**

Process for producing epoxy-modified paper by a chemical reaction on a conventional paper machine by adding at separate points in the papermaking process upstream of a heating section a high molecular weight, polyethyleneimine which is substantive to paper and adding at a separate point an aqueous dispersion of an unreacted epoxy resin such as vinyl cyclohexane dioxide which is curable by said polyethyleneimine.

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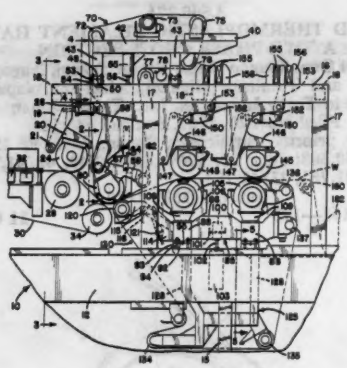
**3,600,273**
**PAPER MACHINE PRESS SECTION**

**Terence E. McCarrick and Norbert Kessler, Watertown, N.Y., assignors to The Black Clawson Company, Hamilton, Ohio**

**Filed Sept. 27, 1968, Ser. No. 763,119**
**Int. Cl. D21f** *1/24*
**U.S. Cl. 162—273** **9 Claims**

A press section of a paper machine includes a suction press roll supported within an endless felt by an inner frame having one side pivotally connected to a main outer

frame and the opposite side releasably secured to the outer frame so that the inner frame may be pivoted by a power operated jack to provide for convenient replacement of the felt. The press section also includes a suction pickup roll supported within the pickup felt in a similar manner.



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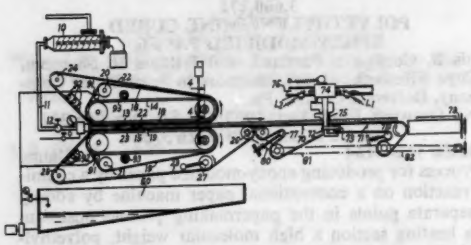
**3,600,274**

**MOULDING DEVICE FOR A SLURRY WHEREIN THE FORMING MEANS INCLUDES OPPOSED SHOES ATTACHED TO OPPOSED ENDLESS CHAINS**

**Kenneth Trickett, Egham, and Thomas Leslie Forsyth, Cleadon, near Sunderland, England, assignors to Newalls Insulation & Chemical Company Limited, Washington, England**

**Filed Feb. 12, 1968, Ser. No. 704,899**
**Claims priority, application Great Britain, Feb. 24, 1967, 9,058/67**
**Int. Cl. D21j** *3/12*
**U.S. Cl. 162—303** **11 Claims**



A machine for continuously filtering a slurry and continuously moulding the solid matter retained from the slurry which comprises two endless belt systems providing a run along which shoes attached end to end along to each of the chains engage one another to define a forming zone which is rigid-walled and of constant cross-section. A nozzle that is sealed with respect to the forming zone functions to discharge slurry between the engaged shoes. Each shoe is provided with passage grooves on the formation-zone side thereof to permit the escape of liquid from the slurry in the forming zone. Layers of filtering material such as endless filter belts extend through the formation zone in overlying relationship to the grooves of each shoe.

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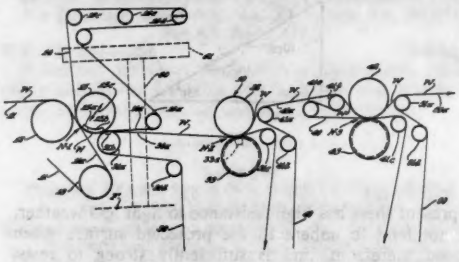
**3,600,275**

**WEB PICKUP**

**Dennis C. Cronin, Rockton, Ill., assignor to Beloit Corporation, Beloit, Wis.**

**Filed May 23, 1968, Ser. No. 731,582**
**Int. Cl. D21f** *2/00*
**U.S. Cl. 162—306** **8 Claims**



This relates to an improved versatile and sturdy papermaking machine structure. The instant machine involves the selective use of a pickup arrangement using a durable porous pickup belt that is not required to travel through a press nip and thus avoids wear incidental to conventional felt washing and reconditioning devices. Also, the present arrangement provides for the use of a simplified first press for only a single felt with the web thereon which affords better initial dewatering, and avoidance of the conventional transfer (two felt) press, using a system which employs standard parts so arranged as to afford best access for maintenance.

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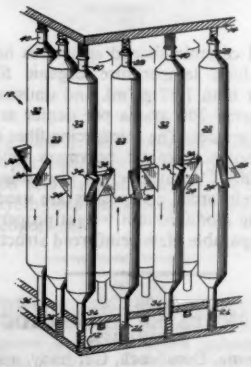
**3,600,276**

**FUEL SYSTEMS FOR NUCLEAR REACTORS**

**John B. Nims, Jr., Royal Oak, Mich. (% Atomic Power Development Associates Inc., 1911 1st St., Detroit, Mich. 48226)**

**Original application May 12, 1967, Ser. No. 638,098. Divided and this application Oct. 7, 1968, Ser. No. 798,503**
**Int. Cl. G21c** *3/12, 7/30*
**U.S. Cl. 176—28** **6 Claims**



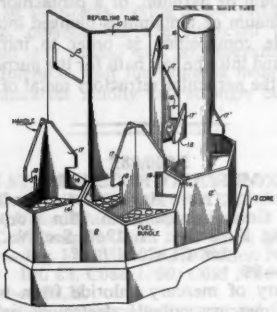
A nuclear reactor comprising an array of fuel subassemblies having tapered cooperating interface surfaces, whereby longitudinal expansion of the sub-assembly causes radial core expansion.

3,600,277

## REFUELING APPARATUS AND METHOD FOR FAST REACTORS

John H. Germer, San Jose, Calif., assignor to the United States of America as represented by the United States Atomic Energy Commission

Filed Oct. 2, 1968, Ser. No. 764,477
Int. Cl. G21c *19/10, 19/20*
U.S. Cl. 176—31 7 Claims



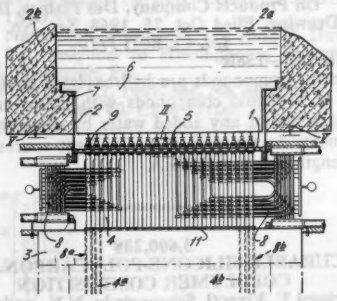
An apparatus and method for transferring fuel bundles in and out of the core of a sodium-cooled fast reactor, utilizing an inert gas filled refueling cell above the reactor and a removable shield plug between the reactor and the refueling cell. Fuel handling is accomplished by a refueling apparatus consisting of two mechanisms, one of which takes fuel bundles between a storage area and a temporary position adjacent to the reactor, and the other transfers fuel between this temporary position and the reactor core while maintaining the fuel elements submerged in the sodium coolant for permitting continuous removal of decay heat therefrom.

2,600,278

## NUCLEAR REACTOR INSTALLATIONS

William Birch, Middlewich, and Christopher Powell, Tunbridge Wells, England, assignors to United Kingdom Atomic Energy Authority, London, England

Filed Mar. 1, 1968, Ser. No. 709,734
Int. Cl. G21c *19/00*
U.S. Cl. 176—61 6 Claims



A nuclear reactor has vertically extending fuel tubes which terminate in a pond above the core. A flexible tube plate is penetrated by the fuel tubes and forms the base of the pond containing structure. The tube plate is supported from flanges on the tubes.

3,600,279

## METHOD FOR PRODUCING D-PANTOIC ACID

Takeshi Takahashi, Osaka, and Masao Isono, Hyogo, Japan, assignors to Takeda Chemical Industries, Ltd., Higashi-ku, Osaka, Japan

No Drawing. Continuation-in-part of application Ser. No. 671,570, Sept. 29, 1967. This application June 1, 1970, Ser. No. 42,509
Int. Cl. C12b *1/00*
U.S. Cl. 195—2 15 Claims

D-pantoic acid is produced from DL-pantoic acid by inoculating a culture medium containing the latter with a bacterium which assimilates L-pantoic acid but cannot assimilate D-pantoic acid, incubating the culture until L-pantoic acid is substantially consumed, and recovering the unassimilated D-pantoic acid.

3,600,280

## PROCESS FOR PREPARING ACETALS AND KETALS OF 2β,16α,17α-TRIHYDROXY STEROIDS

Patrick A. Diassi, 77 Sandy Hill Road, Westfield, N.J. 07090, and Pacifico A. Principe, 11 Monush St., South River, N.J. 08882

No Drawing. Original application Mar. 21, 1968, Ser. No. 714,784. Divided and this application June 6, 1969, Ser. No. 831,217
Int. Cl. C07c *167/08*
U.S. Cl. 195—51R 1 Claim

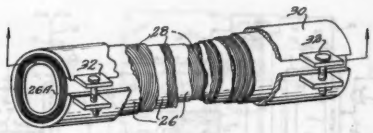
This invention relates to the production of acetals and ketals of 2β,16α-dihydroxyhydrocortisone and acyl derivatives thereof. These compounds are prepared by subjecting acetals and ketals of 16α-hydroxycortexolone to the action of enzymes of *Absidia coerulea*. The final products of this invention are therapeutically useful compounds possessing anti-inflammatory and progestational activity. In addition, the products of this invention are useful as anti-oxidants and anti-corrosive agents. They are also surfactants and thus may be employed as emulsifiers and wetting agents.

3,600,281

## MICROSTABILIZED SUPERCONDUCTOR

Wilfried H. Bergmann, Naperville, Ill., assignor to the United States of America as represented by the United States Atomic Energy Commission

Filed June 18, 1969, Ser. No. 834,427
Int. Cl. H01f *7/22*
U.S. Cl. 335—216 5 Claims



A microstabilized superconductor comprises a superconducting material of the hard Type II series sized in cross sectional area less than 1000 times the coherence length of the material.

3,600,282

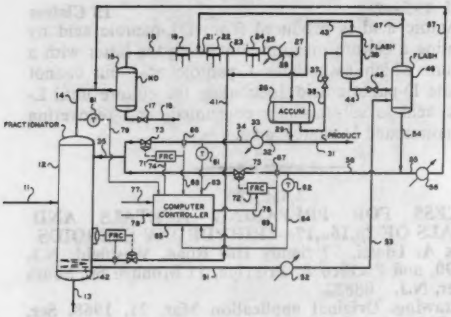
## CONTROL OF TWO REFLUX STREAMS IN A FRACTIONAL SEPARATION SYSTEM

Dale E. Lupfer, Sweeny, Tex., and James W. Hobbs, Bartlesville, Okla., assignors to Phillips Petroleum Company

Filed Nov. 19, 1968, Ser. No. 776,951
Int. Cl. B01d *3/42*
U.S. Cl. 202—160 6 Claims

In a fractional distillation system having two sources of liquid reflux streams which will partially vaporize when combined for such use, the flow rate and temperature of

each of the liquid reflux streams are measured and signals representative thereof are applied to a computer-controller. The signals are combined to establish a signal representative of the preflash temperature of the combined stream, which is then employed in an internal reflux control to




determine the required external reflux flow rate. The flow rate of one of the liquid streams is manipulated responsive to a desired control criteria while the flow rate of the other liquid stream is manipulated to provide the balance of the external reflux.

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**3,600,283**

## AMMONIA STRIPPER OVERHEAD CONTROL METHOD

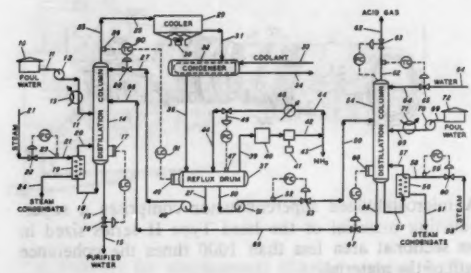
**Walter M. Bollen, San Rafael, Calif., and William Leigh Short, Amherst, Mass., assignors to Chevron Research Company, San Francisco, Calif.**

**Continuation-in-part of application Ser. No. 680,267, Nov. 2, 1967. This application May 7, 1969, Ser. No. 822,700**

**The portion of the term of the patent subsequent to Oct. 1, 1985, has been disclaimed**

**Int. Cl. B01d** *3/42*

**U.S. Cl. 203—1** **6 Claims**




Method for controlling an ammonia distillation column used to strip ammonia from an aqueous solution containing ammonia which comprises: cooling and partially condensing overhead vapors from the ammonia distillation column, receiving the partially condensed overhead from the ammonia distillation column in a reflux drum, controlling reflux to the distillation column responsive to temperature in the overhead vapor line from the ammonia distillation column, and controlling the overhead temperature responsive to the liquid level in the reflux drum.

**3,600,284**

## METHOD OF ADDING REFRACTORY METAL HALIDES TO MOLTEN SALT ELECTROLYTES

**George M. Martinez, Henderson, Nev., assignor to the United States of America as represented by the Secretary of the Interior**

**No Drawing. Filed Feb. 18, 1969, Ser. No. 800,277**

**Int. Cl. C22d** *3/00*

**U.S. Cl. 204—64R** **8 Claims**

An integrated solid mass, e.g., a globule, of a tetrachloride of zirconium or hafnium, or a pentachloride of niobium, molybdenum or tantalum is plunged into a molten salt electrolyte composition in order to introduce this metal compound into the salt bath for the purpose of electrodepositing the particular refractory metal of said metal compound.

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**3,600,285**

## MERCURY RECOVERY

**Edward J. Botwick, New Haven, and Darrell B. Smith, Cheshire, Conn., assignors to Olin Corporation**

**No Drawing. Filed Oct. 21, 1969, Ser. No. 868,206**

**Int. Cl. C01d** *1/08*

**U.S. Cl. 204—99** **5 Claims**

The recovery of mercury chloride from weak brines effluent from mercury cathode electrolytic cells by contacting said effluent with activated carbon, washing said carbon with water, then heating in a stream of inert gas and condensing mercury chloride by cooling the gas.

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**3,600,286**

## ELECTROLYTIC TREATMENT OF AQUEOUS SOLUTIONS

**Rolland C. Sabins, Lakeside, Calif., assignor to Selectro-Chem Company, Salt Lake City, Utah**

**Filed Feb. 26, 1968, Ser. No. 708,185**

**Int. Cl. C02b** *1/82;* **C01b** *7/06*

**U.S. Cl. 204—149** **7 Claims**

The method of and system for liberating a gas or gases from an electrolyte through the use of two electrodes within the electrolyte and connected with a direct current to form, with the electrolyte, an internal circuit and cyclically reversing the polarity of the electrodes. The system further comprehends subjecting a third electrode to the electrolyte which is connected with the positive side of the direct current as long as the system is in operation.

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**3,600,287**

## HYDROXYLATION OF AROMATIC COMPOUNDS

**Stephen N. Massie, Palatine, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.**

**No Drawing. Filed Oct. 25, 1968, Ser. No. 770,817**

**Int. Cl. B01j** *1/10*

**U.S. Cl. 204—158R** **10 Claims**

Aromatic compounds are hydroxylated by reacting an excess of aromatic compounds with hydrogen peroxide in the absence of any added water by subjecting the two components to the emission of a light source having a wave length less than 3500 A.

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**3,600,288**

## CURABLE SILICONE-POLYCARBONATE COPOLYMER COMPOSITION

**Richard V. Viventi, Schenectady, N.Y., assignor to General Electric Company**

**No Drawing. Filed Jan. 3, 1969, Ser. No. 788,961**

**Int. Cl. B01j** *1/10;* **C08g** *47/10*

**U.S. Cl. 204—159.13** **4 Claims**

Organopolysiloxane-polycarbonate copolymers having allylcarbonate chain terminals are cured at room temperature employing organosilicon materials having a plurality of mercaptoalkyl substituents.

3,600,289

## TREATMENT OF RESIN SURFACES TO IMPROVE ADHESIVE BONDING, RESIN BODIES WITH TREATED SURFACES AND ADHESIVE PROCESS

Robert A. Bragole, Peabody, Mass., assignor to USM Corporation, Flemington, N.J.

No Drawing. Continuation-in-part of abandoned application Ser. No. 664,648, Aug. 31, 1967. This application Apr. 21, 1969, Ser. No. 818,045

Int. Cl. C08d *1/00*; C08f *1/16*

U.S. Cl. 204—159.14 16 Claims

Surfaces of substrates having a low surface tension of wetting, e.g. polyethylene are subjected to ultraviolet radiation and then treated with polyisocyanate. The polyisocyanate interacts with the radiated material to create a surface character readily and strongly bonded by adhesives.

3,600,290

## FURAN-STABILIZED BETA-HYDROXY ESTER COATING COMPOSITIONS

Chester W. Fitko, Chicago, Ill., assignor to Continental Can Company, Inc., New York, N.Y.

No Drawing. Filed Jan. 15, 1970, Ser. No. 3,197

Int. Cl. C08d *1/00*; C08f *1/16*

U.S. Cl. 204—159.22 15 Claims

A composition stabilized to prevent gel formation but which remains susceptible to polymerization by ionizing radiation comprised of a mixture of a furan compound and an ethylenically unsaturated beta-hydroxy ester prepared from a polyepoxide and an alpha, beta-ethylenically unsaturated monocarboxylic acid such as acrylic or methacrylic acid. The beta-hydroxy ester/furan composition when applied to a substrate as a film and exposed to a source of ionizing radiation for a time sufficient to effect polymerization of the film, cures to a hard, infusible coating.

3,600,291

## METHOD OF PRODUCING DENSE CARBON FROM ANTHRACENE

Richard H. Wiley, New York, N.Y., assignor to the United States of America as represented by the United States Atomic Energy Commission

No Drawing. Filed Jan. 28, 1969, Ser. No. 794,761

Int. Cl. C07c *3/24*

U.S. Cl. 204—162 2 Claims

A process for producing dense carbon products comprising exposing organic compounds to coherent radiation of greater than 1.0 joule per millisecond.

3,600,292

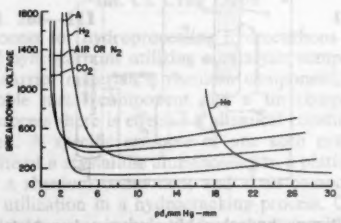
## LOCALIZED MACHINING AND DEPOSITION FOR MICROELECTRONIC COMPONENTS BY SPUTTERING

Harvey C. Nathanson, Pittsburgh, and John R. Davis, Jr., Export, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Mar. 11, 1969, Ser. No. 806,264

Int. Cl. C23c *15/00*

U.S. Cl. 204—192 14 Claims




A sputtering process is described that is suitable for highly localized deposition and machining of elements of microelectronic components employing a stream of gas in an atmosphere at least within an order of magnitude of atmospheric pressure between closely spaced sputtering electrodes which are preferably supported by the component substrate. Applications to microelectronic components such as for tuning the vibratory members of resonant gate transistors are described.

3,600,293

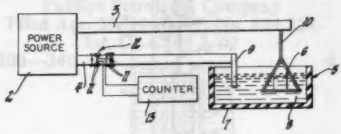
## MONITORING DEVICE FOR COUNTING PARTS PASSING THROUGH AN ELECTROLYTIC BATH

Stanley J. Hyduk and Leo Z. Zeleney, Warren, Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Jan. 10, 1969, Ser. No. 790,300

Int. Cl. B01k *3/00*; C23b *5/06, 5/68*

U.S. Cl. 204—194 3 Claims




A reed switch, responsive to an electromagnetic field, is attached to a conductor and is closed when the electric current through the conductor reaches a predetermined value. Since the current through a bus bar (conductor) that supplies energy to an electroplating bath varies as the total surface area of the parts being plated varies, closure of the reed switch is indicative of the fact that a part or given number of parts has passed through the plating bath.

3,600,294

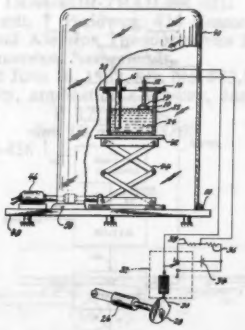
## ELECTROCRYSTALLIZER

Bernard Rubin, Belmont, and John J. O'Connor, Arlington, Mass., assignors to the United States of America as represented by the Secretary of the Air Force

Filed Aug. 15, 1967, Ser. No. 660,839

Int. Cl. B01k *3/00*; C23b *5/00, 7/00*

U.S. Cl. 204—228 1 Claim



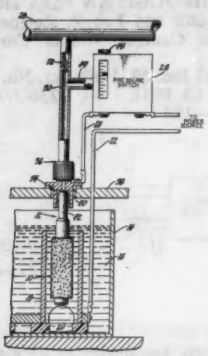
An apparatus and method for growing single crystals comprising an electrochemical circuit including a means for alternating in an asymmetrically timed manner the direction of current flow within the electrochemical circuit. Also included is a means to effect the vertical movement of the electrochemical circuit's electrolyte in a downward direction away from a growing crystal at a rate substantially similar to the rate of growth of the growing crystal.

3,600,295

## METHOD AND APPARATUS FOR PRODUCING POROUS METAL PARTS HAVING UNIFORM FLUID PERMEABILITY

Donald A. Voorhies, Wauwatosa, Wis., assignor to General Motors Corporation, Detroit, Mich.

Original application Nov. 15, 1966, Ser. No. 594,480, now Patent No. 3,480,530, dated Nov. 25, 1969. Divided and this application Apr. 30, 1969, Ser. No. 820,436
Int. Cl. B01k *3/00, 3/04*
U.S. Cl. 204—229 2 Claims



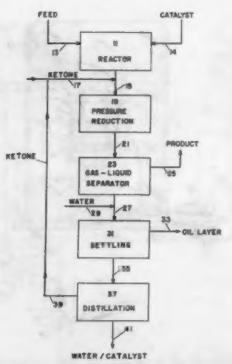
Precise control over the permeability of a porous metal part is accomplished by monitoring the flow rate of the air through the part during electrolytic erosion of metal from the surface pores. The electrolytic erosion is automatically discontinued when the back pressure of the air falls below a predetermined value.

3,600,296

## CONTINUOUS RECOVERY OF HYDROCARBON PRODUCT FROM EFFLUENT CONTAINING FRIEDEL-CRAFTS CATALYST THEREIN

Robert W. Rieve, Springfield, Pa., assignor to Atlantic Richfield Company, New York, N.Y.

Filed July 22, 1969, Ser. No. 843,469
Int. Cl. C10g *21/16;* C07c *7/00*
U.S. Cl. 208—13 5 Claims




A process for the elimination of sludges and complexes that form when Friedel-Crafts catalysts are used in hydrocarbon reactions said process including the addition of acetone, diacetyl, or methylethylketone to the reactor effluent as the effluent leaves the reaction vessel thereby dissolving the sludges and complexes as formed, and preventing any undesired accumulation of said sludges and complexes from fouling the reaction facilities, and preventing losses of catalyst and hydrocarbon which ordinarily become bound up in said sludges and complexes.

3,600,297

## PREPARATION OF EASILY SEPARABLE ADDUCTS IN THE DEPARAFFINATION OF HYDROCARBONS WITH UREA

Hermann Franz, Neu-Isenburg, Bertold Fritz, Koppern, Taunus, and Max Kunert, Frankfurt am Main-Fechenheim, Germany, assignors to Edeleanu Gesellschaft mbH, Frankfurt am Main, Germany

No Drawing. Filed June 6, 1968, Ser. No. 734,886
Claims priority, application Germany, June 13, 1967, E 34,172
Int. Cl. C07b *21/00*
U.S. Cl. 208—25 10 Claims

Improvements in the process for the preparation of granular, readily separable adducts of paraffin and urea in the deparaffination of hydrocarbon oils with urea by direct heat exchange of the temperature of the adduct mixtures formed utilizing as the direct heat exchange medium and/or oil solvent vapor introduced directly into the reaction mixture, with the heat of condensation of said steam and/or oil solvent vapor producing the required temperature elevation.

3,600,298

## PROCESS FOR PRODUCING HYDROGENATED ALKYL TARS

Osamu Mayumi, Chiba, and Masaaki Takahashi, Tokyo, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

No Drawing. Filed Mar. 30, 1970, Ser. No. 23,962
Claims priority, application Japan, Mar. 28, 1969, 44/23,682
Int. Cl. C10c *1/20*
U.S. Cl. 208—44 9 Claims

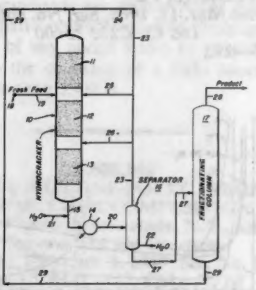
This invention relates to a process for the production of hydrogenated alkyl tars comprising the steps of desulfurization and alkylation with a lower olefin in the presence of a catalyst, of a tar fraction obtained by the thermal cracking of petroleum hydrocarbon at a temperature between 700° C. and 2300° C., followed by hydrogenation of the resulting alkyl tar in the presence of a suitable hydrogenation catalyst.

3,600,299

## MULTIZONE HYDROCRACKING PROCESS

James C. Koller, Chicago, Ill., assignor to Standard Oil Company, Chicago, Ill.

Filed Nov. 15, 1968, Ser. No. 776,018
Int. Cl. C10g *23/00*
U.S. Cl. 208—89 12 Claims




A multizone hydrocracking process in which the first catalytic zone comprises a conventional acid-type hydrocracking catalyst, the second catalytic zone comprises a

denitrogenation catalyst and the third catalytic zone comprises a molecular sieve-type hydrocracking catalyst. The fresh feed, including both hydrocarbon and hydrogen, is introduced into the second zone where the hydrocarbon is denitrogenated and sent to the third zone where the hydrocarbon is partially hydrocracked. Liquid product from the third zone is divided into a high boiling fraction and a low boiling fraction, and the high boiling fraction is recycled to the first zone for further hydrocracking. The effluent from the first zone continues on and is mixed with the fresh feed in the second zone. Gaseous effluent from the third zone is recycled to the first, second and/or third zones where it provides necessary hydrogen gas and aids in controlling catalyst temperatures. The low boiling liquid fraction is recovered as product.

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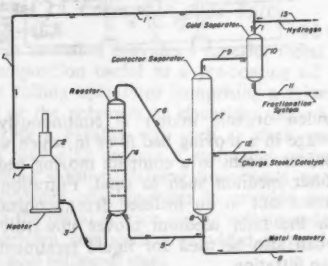
**3,600,300**
**SLURRY PROCESSING FOR BLACK OIL CONVERSION**
**Laurence R. Steenberg, Glenview, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.**
**Filed Nov. 26, 1968, Ser. No. 779,013**
**Int. Cl. C10g *13/00***
**U.S. Cl. 208—108** **8 Claims**




A catalytic slurry process for effecting the conversion of a hydrocarbonaceous charge stock containing hydrocarbon-insoluble asphaltenes. The slurry constitutes a mixture of the major proportion of the charge stock, principally 650° F.-plus material, a portion of a previously treated product effluent, and from about 0.4% to about 10.0% by weight of finely-divided solid catalyst particles, on the basis of total liquid feed. The process is effected in a continuous manner, and preferably in an upflow reaction chamber wherein the slurry and hydrogen are individually introduced at a lower portion and the product effluent withdrawn from an upper portion.

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**3,600,301**
**HYDROCARBON HYDROPROCESSING**
**Richard E. Rausch, Mundelein, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.**
**No Drawing. Continuation-in-part of application Ser. No. 819,114, Apr. 24, 1969. This application June 16, 1969, Ser. No. 833,664**
**Int. Cl. C10g *13/02***
**U.S. Cl. 208—111** **10 Claims**

A process for hydroprocessing hydrocarbons and mixtures of hydrocarbons utilizing a catalytic composite of a porous carrier material, a rhenium component, a Group VIII noble metal component and a tin component, in which process there is effected a chemical consumption of hydrogen. A specific example of one such catalyst is a composite of a crystalline aluminosilicate, a platinum component, a rhenium component and a tin component, for specific utilization in a hydrocracking process. Other specific hydroprocesses include the hydrogenation of aromatic nuclei, the ring-opening of cyclic hydrocarbons, desulfurization, denitrification, hydrogenation, etc.

**3,600,302**
**LUBE EXTRACTION WITH MIXED SOLVENTS**
**Charles C. Hong, Sarnia, Ontario, Canada, assignor to Esso Research and Engineering Company**
**No Drawing. Filed Apr. 3, 1969, Ser. No. 813,334**
**Int. Cl. C10g *21/02***
**U.S. Cl. 208—323** **16 Claims**

An improved process for the solvent extraction of petroleum oil fractions. A two-component mixed solvent, where Component A comprises a polar solvent and Component B comprises a glycol ether, is used to selectively extract the more aromatic type constituents from a lube oil feed. Results obtained with these mixed solvents are compared with phenol and aqueous phenol.

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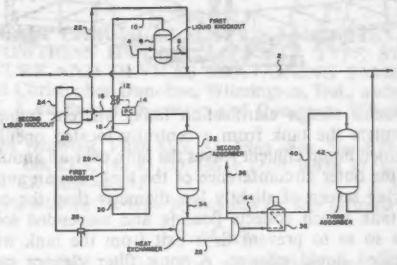
**3,600,303**
**PROCESSING A PORTION OF A HIGH PRESSURE GAS STREAM**
**Julius E. Schneider, Bartlesville, Okla., assignor to Phillips Petroleum Company**
**Filed Apr. 25, 1969, Ser. No. 819,224**
**Int. Cl. C10g *5/02***
**U.S. Cl. 208—340** **9 Claims**




A method for processing a portion of gas from a high pressure rich gas stream wherein liquids are removed from the gas, adsorbers are regenerated with processed heated gas, and removed liquids are reinjected into the high pressure rich gas stream.

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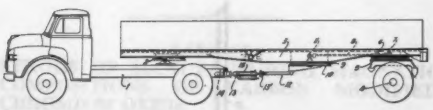
**3,600,304**
**TRACTOR-TRAILER RIG**
**Willi Hildebrandt, 7 Waldweg, 424 Emmerich-Huthum, Germany, and Aloysius Theodorus van Huet, Schoolstraat 9, Pannerden, Netherlands**
**Filed June 16, 1969, Ser. No. 833,817**
**Claims priority, application Germany, June 14, 1968, P 17 55 736.7**
**Int. Cl. B26d *53/00***
**U.S. Cl. 280—426** **8 Claims**



A tractor-trailer comprises a tractor and a trailer whose rear end is provided with an axle turnable about a vertical axis, and whose front end is arranged to rest on and be turnably secured to the rear end of the trailer. A turning arrangement is provided intermediate the front and rear ends of the trailer secured thereto turnable about an additional vertical axis parallel to the first-mentioned one, and a linkage arrangement links the turning arrangement to

the axle of the trailer for turning movement in unison therewith. Limiting means connects the turning arrangement with the tractor so that the turning movement of the axle about its vertical axis, and thereby the angle which can be included between the tractor and the trailer when one of them moves laterally with respect to the other—as in turning a corner—is limited to a predetermined extent.

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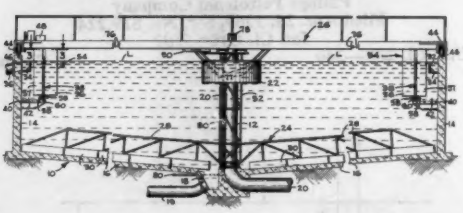
**3,600,305**
**SONIC FILTER CLEANING APPARATUS AND METHOD**
**Philip Edgerton, Holicong, Pa., assignor to FMC Corporation, San Jose, Calif.**
**Filed Apr. 2, 1970, Ser. No. 25,001**
**Int. Cl. B01d** *21/24*
**U.S. Cl. 210—19** **13 Claims**



A circular sludge clarification tank, wherein influent sludge enters the tank from a centrally located opening and clarified liquid effluent leaves the tank over an annular weir at the outer circumference of the tank, has an annular filtering screen of slightly less diameter than the collection tank which collects floating and suspended solid particles so as to prevent their exit from the tank with the clarified liquid effluent. A sonic filter cleaner containing sonic transducers and two submersible pumps, straddles the filtering screen and moves circumferentially around the tank while sonically vibrating solid particles off the screen and quickly withdrawing them from the tank with the pumps. The withdrawn solid particles, comprising a slurry of filtrate, are pumped back and introduced into the tank a second time with the influent liquid for recycling.

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**3,600,306**
**THIN LAYER CHROMATOGRAPHY METHOD AND APPARATUS**
**Paul M. Tocci, Miami, Fla., assignor to TLC Corporation, Miami, Fla.**
**Filed Sept. 5, 1969, Ser. No. 855,477**
**Int. Cl. B01d** *15/08*
**U.S. Cl. 210—31** **19 Claims**

A disposable chromatographic unit which includes (a) a semi-solid solvent, (b) stain, (c) a chromatographic plate, and (d) a chromatography tank in one package. The semi-solid solvents are premixed together with the stain so as to be available for use at any time. The entire equipment is disposable, the structural parts being made of inexpensive plastic or metal foil which is light weight and which can be thrown away after a single use.

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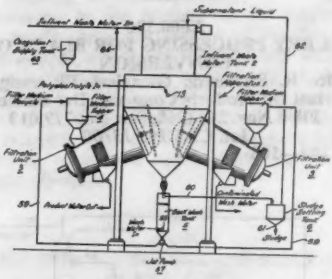
**3,600,307**
**LIQUID PURIFICATION SYSTEM**
**Edward C. Kehoe, North Caldwell, and Robert Rinaldi, Fairfield, N.J., assignors to Johns-Manville Corporation, New York, N.Y.**
**Continuation-in-part of application Ser. No. 580,780, Sept. 20, 1966. This application Mar. 12, 1968, Ser. No. 716,269**
**Int. Cl. B01d** *23/10*
**U.S. Cl. 210—33** **17 Claims**



Suspended organic matter is continuously removed from sewage in a moving bed filter in which waste water flows countercurrent to a compact moving bed of a particular filter medium such as sand. Filtration is preferably carried out in an inclined frusto-conical chamber in which the filter medium moves upwardly. The apparatus can also be used for liquid treatment processes other than filtration.

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**3,600,308**
**METHOD OF CLARIFYING AQUEOUS SUSPENSIONS WITH POLYMERIZED LIGNIN DERIVATIVES**
**George G. Allan, Seattle, Wash., assignor to Weyerhaeuser Company, Tacoma, Wash.**
**No Drawing. Continuation-in-part of application Ser. No. 602,185, Dec. 16, 1966. This application Sept. 12, 1969, Ser. No. 857,542**
**Int. Cl. C02b** *1/20*
**U.S. Cl. 210—52** **10 Claims**

A forest-derived material for use as a coagulant and the method of use of the coagulant is described. Lignin and ligno-sulfonate materials are reacted with various chemical agents to increase their molecular weight for use as coagulants. The method of using high molecular weight, forest-derived phenolic polymers as coagulants and clarifying agents in aqueous systems is described. The novel coagulants may be used in conjunction with traditionally used coagulants to increase the rate of coagulation.

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**3,600,309**
**SOLID LUBRICANT FOR REDUCING DIE-PLATING AND DIE-DRAG DURING THE EXTRUSION OF VISCOUS RUBBER AND ELASTOMERIC PLASTIC COMPOSITIONS**
**Thomas N. Loser, Yardley, Pa., and Thomas Jones, Piscataway, N.J., asssignors to Wyrough & Loser, Inc., Trenton, N.J.**
**No Drawing. Filed Jan. 12, 1968, Ser. No. 697,308**
**Int. Cl. C10m** *7/28*
**U.S. Cl. 252—12** **15 Claims**

A new lubricating method and a new solid lubricant composition for reducing die-plating or die-buildup and

die-drag during the extrusion of viscous rubber and elastomeric plastic compositions in the form of a green stock which usually contains reinforcing agents, fillers, pigments, etc., the active lubricant ingredient being finely divided polytetrafluorethylene granular powder having an average particle size of at least 0.5 micron, preferably 1 to 8 microns, and being effective in an amount of 0.05 to 0.45 part per 100 parts of rubber or plastic elastomer. Especially benefitted are "draggy" extrusion compositions based upon butyl rubber, cross-linked polyethylene, natural rubber, butadiene-acrylonitrile rubber, chlorosulfonated polyethylene rubber (Hypalon), neoprene, ethylene propylene rubbers, styrene-butadiene rubbers, acrylonitrile-butadiene-styrene rubbers, polybutadiene, polyisoprene, epichlorohydrin (Hydrin) rubbers, flexibilized polyvinychloride, and ethylene vinyl acetate copolymers.

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3,600,310

## LUBRICANT FOR METAL WORKING

**Alan R. Eyres and Jacques C. Dillon-Corneck, Mullica Hill, N.J., assignors to Mobil Oil Corporation, New York, N.Y.**

**No Drawing. Filed Mar. 20, 1969, Ser. No. 808,987**
**Claims priority, application Great Britain, Jan. 10, 1969, 1,673/69**
**Int. Cl. C10m** *1/38, 3/04, 5/10*
**U.S. Cl. 252—48.6** **11 Claims**

The present invention provides a superior metal rolling lubricant composition useful as a pre-coating oil and as a coating in rolling operations comprising a mineral oil, a fatty acid or the polymers or glycerides thereof, and a wax, preferably a paraffin wax such as slack wax. The composition may also contain a sulfurized mineral oil, or fats, or other sulfur-containing compounds, as well as organic phosphates or phosphites to provide increased protection to the metal surface during coiling and uncoiling. The lubricant composition provided is particularly useful in the cold rolling of steel.

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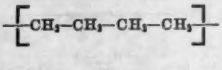
3,600,311

## HYDROCARBON SYSTEMS CONTAINING BRANCHED ALKYLENE POLYMERS

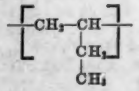
**Michael I. Naiman, William J. Heintzelman, and Robin A. McLaren, St. Louis, Mo., assignors to Petrolite Corporation, Wilmington, Del.**

**No Drawing. Continuation-in-part of appplication Ser. No. 432,002, Feb. 11, 1965. This application Sept. 3, 1968, Ser. No. 757,086**
**Int. Cl. C10m** *1/18*
**U.S. Cl. 252—59** **12 Claims**

A hydrocarbon system normally subject to the uncontrolled deposition of wax which is improved by the presence therein of a composition comprising branched alkylene polymers, for example alkylene polymers characterized by (1) a molecular weight of about 1,000–50,000; (2) about 90–45%



units, and (3) about 10–55%



units.

These polymers are prepared, for example, from hydrogenated polybutadienes.

These systems include, for example, the use of these branched alkylene polymers as pour point depressants, for example in petroleum distillates; as viscosity improvers for lube oils; as paraffin deposition inhibitors in petroliferous fluids, and the like.

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3,600,312

## HEAT INSULATION MATERIAL FOR INSULATED CONTAINERS

**Robert J. Bohland, North Canton, Ohio, assignor to Diebold, Incorporated, Canton, Ohio**

**No Drawing. Filed May 26, 1969, Ser. No. 827,980**
**Int. Cl. C04b** *43/00;* **C09k** *3/28;* **A62c** *3/00*
**U.S. Cl. 252—62** **6 Claims**

A heat insulating material for the walls of fire-resistive safes, insulated vault doors, and insulated record containers, including water-in-wax capsules in cement and vermiculite containing compositions which form the heat insulating filling material for the walls of such safes, vault doors or containers. The encapsulated water provides an increased water content for the insulating filling, without increasing the "free water" in the filling which can leak from the insulation and initiate mold, odor and rust problems, thereby increasing fire protection while retaining favorable weight characteristics.

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3,600,313

## COBALT CHROMIUM SULFIDE MAGNETIC COMPOSITIONS HAVING A PYRITE TYPE STRUCTURE AND DEVICES CONTAINING SAME

**Paul Christopher Donohue, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.**

**No Drawing. Filed Oct. 31, 1969, Ser. No. 873,064**
**Int. Cl. C04b** *35/00;* **H01v** *3/00;* **H01b** *37/32*
**U.S. Cl. 252—62.51** **6 Claims**

Magnetic pyrite-type phases having the formula

$$Co_{1-x}Cr_xS_2$$

where $x$=0.01 to 0.4. The compositions are useful in magnetic switching devices, temperature sensing devices, and the like.

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3,600,314

## MAGNETIC COMPOSITIONS OF CHROMIUM OXIDE AND METHODS OF MANUFACTURE

**Robert S. Haines, Boulder, Colo., assignor to International Business Machines Corporation, Armonk, N.Y.**

**No Drawing. Filed Dec. 22, 1969, Ser. No. 887,310**
**Int. Cl. C01g** *37/02*
**U.S. Cl. 252—62.51** **7 Claims**

This invention relates to the formation of ferromagnetic chromium oxide compositions containing 59% to 62% chromium and 0.05% to 0.90% carbon combined with oxygen, and in the form of uniform, finely divided particles of tetragonal crystalline structure. The process of forming ferromagnetic chromium oxide consists of treating a chromium compound with carbon or carbon containing compound, and then subjecting the mixture to heat and pressure decomposition.

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3,600,315

## METHODS OF MANUFACTURING MAGNETIC COMPOSITIONS OF CARBON MODIFIED CHROMIUM OXIDE

**Robert S. Haines, Boulder, Colo., assignor to International Business Machines Corporation, Armonk, N.Y.**

**No Drawing. Filed Dec. 22, 1969, Ser. No. 887,412**
**Int. Cl. C01g** *37/02*
**U.S. Cl. 252—62.51** **4 Claims**

This invention relates to the formation of ferromagnetic chromium oxide compositions containing 59% to 62% chromium and 0.05% to 0.90% carbon combined with oxygen, and in the form of finely divided particles of tetragonal crystalline structure. The process of forming carbon modified ferromagnetic chromium oxide consists

of mixing a soluble chromium halide compound with an organic complexing agent, associating the complex with additional chromium compound, and then subjecting the mixture to heat and pressure decomposition.

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3,600,316
**METHOD OF PRODUCING A DESCALING COMPOSITION FROM SODIUM HYDROXIDE, SODIUM AND HYDROGEN UNDER PRESSURE**
**Jiri Mostecky, Prague, Milan Stanek, Frydek-Mistek, Zdenek Koudela, Novy Bohumin, and Eva Schierova, Ostrava-Poruba, Czechoslovakia, assignors to Lachema, Narodni Podnik, Brno, Czechoslovakia**
**No Drawing. Filed Aug. 20, 1968, Ser. No. 753,870**
**Int. Cl. C02b** *5/02;* **C23g** *1/28*
**U.S. Cl. 252—80** **7 Claims**

A composition for descaling and surface treatment, particularly useful for the treatment of metal surfaces, is produced by reacting at elevated pressure and temperature a mixture of sodium hydroxide, sodium and hydrogen, whereby the hydrogen is supplied in the form of a hydrogen-containing gas under pressure.

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3,600,317
**NONCAKING DISHWASHING DETERGENT**
**Anthony Ethelbert Lintner, 920 Berkshire Ave., Pittsburgh, Pa. 15226**
**No Drawing. Continuation-in-part of application Ser. No. 608,505, Jan. 11, 1967. This application Jan. 27, 1970, Ser. No. 6,319**
**Int. Cl. C11d** *7/56*
**U.S. Cl. 252—99** **7 Claims**

A method of making a chemically stable domestic dishwashing detergent is disclosed in which excellent cleaning properties are combined with the ability to resist caking by the controlled addition of, typically, about 2% water to anhydrous sodium tripolyphosphate.

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3,600,318
**ENZYME-CONTAINING DETERGENT COMPOSITIONS FOR NEUTRAL WASHING**
**Roy C. Mast, Colerain Township, Hamilton County, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio**
**No Drawing. Continuation-in-part of application Ser. No. 737,301, June 17, 1968. This application June 2, 1969, Ser. No. 829,787**
**Int. Cl. C11d** *7/18, 7/56*
**U.S. Cl. 252—99** **17 Claims**

Enzyme-containing detergent compositions adapted for use under neutral and near-neutral conditions of pH are disclosed. The detergent compositions consist essentially of a synthetic organic detergent characterized by solubility in water of at least 0.05% at about 80° F. to about 130° F., efficient soil-removing and soil-dispersing properties in water in an amount of about 0.05%, resistance to precipitation by hard water mineral ions; 0.001% to 10% of a proteolytic enzyme characterized by proteolytic activity up to about 130° F. in the pH range of from 6 to 8.5; and a proteolytic enzyme-stabilizing neutral inorganic electrolyte salt.

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3,600,319
**PROCESS FOR APPLICATION OF ENZYMES TO SPRAY-DRIED DETERGENT GRANULES**
**Burton H. Gedge III, Wyoming, and Charles H. Brain, Mount Healthy, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio**
**Filed June 25, 1968, Ser. No. 739,827**
**Int. Cl. C11d** *9/00, 3/065, 1/18*
**U.S. Cl. 252—114** **6 Claims**

Enzymes are applied to spray-dried silicate-containing detergent granules by slurrying enzyme powder in a liquid, organic vehicle and spraying the slurry onto the granules at a temperature below 140° F.

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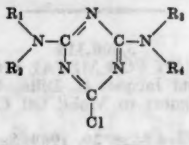
3,600,320
**LOW SUDSING DETERGENT AND CLEANING AGENTS**
**Edmund Schmadel, Mettmann, and Markus Berg, Dusseldorf-Holthausen, Germany, asssignors to Henkel & Cie G.m.b.H., Dusseldorf-Holthausen, Germany**
**No Drawing. Filed Mar. 27, 1968, Ser. No. 716,314**
**Claims priority, application Germany, Apr. 1, 1967, H 62,325**
**Int. Cl. C11d** *3/28*
**U.S. Cl. 252—137** **6 Claims**

Low sudsing detergent and cleaning compositions containing a water-insoluble triazine derivative of the formula:



wherein $R_1$ and $R_3$ each represents hydrogen or an organic radical containing 1 to 24 carbon atoms and $R_2$ and $R_4$ each represent an organic radical containing 2 to 24 carbon atoms; said organic radical designating substituted or unsubstituted straight or branched chain aliphatic, cycloaliphatic or aromatic groups which may contain heteroatoms in their chains.

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3,600,321
**DIMETHYL FORMAMIDE-CONTAINING CORROSION INHIBITOR**
**Robert J. Tedeschi, Whitehouse Station, and Paul W. Natali, Middletown, N.J., assignors to Air Products and Chemicals, Inc., Allentown, Pa.**
**No Drawing. Filed Dec. 31, 1968, Ser. No. 789,023**
**Int. Cl. C11d** *7/32*
**U.S. Cl. 252—148** **5 Claims**

Aqueous acid solutions are inhibited against corrosion of metals, especially ferrous metals, by incorporation of a corrosion-inhibiting system composed of a combination of 1-hexyn-3-ol, 5-decyn-4,7-diol and dimethyl formamide.

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3,600,322
**PAINT REMOVAL FORMULATION**
**Charles R. W. Morison, Clearwater, Fla., assignor to Union Carbide Corporation**
**No Drawing. Filed May 29, 1968, Ser. No. 732,843**
**Int. Cl. C09d** *9/00;* **C11d** *7/50;* **C23g** *5/02*
**U.S. Cl. 252—171** **3 Claims**

A paint remover composition comprising a methylene chloride-methanol solvent and a quaternary nitrogen containing cellulose ether.

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3,600,323
**METHOD FOR PREPARING STABLE URANIA-PLUTONIA SOLS**
**Othar K. Tallent, Oak Ridge, Tenn., assignor to the United States of America as represented by the United States Atomic Energy Commission**
**No Drawing. Filed Oct. 6, 1969, Ser. No. 864,154**
**Int. Cl. C09k** *3/00*
**U.S. Cl. 252—301.1S** **8 Claims**

A method for preparing stable urania-plutonia sols which exhibit minimal oxidation-reduction between the tetravalent ionic species is provided by preparing a nitrate-stabilized polymeric tetravalent plutonium sol by alcohol extraction of a plutonium nitrate solution, mixing the

tetravalent plutonium sol with a crystalline, nitrate-stabilized, tetravalent uranium sol and thereafter removing nitrate by solvent extraction.

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3,600,324

## TERBIUM ACTIVATED STRONTIUM ORTHOPHOSPHATE PHOSPHOR

Alfred Bril and Willem Lambertus Wanmaker, Emmasingel, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 23, 1968, Ser. No. 785,911

Claims priority, application Netherlands, Dec. 22, 1967, 6717638

Int. Cl. C09k *1/36*

U.S. Cl. 252—301.4P 2 Claims

Terbium activated strontium orthophosphate luminescent material useful as a phosphor in television receiver picture tubes.

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3,600,325

## AEROSOL FABRIC DE-WRINKLER

Karl L. Kaufman and Doris N. Martin, Indianapolis, Ind., and William J. Brown, Chicago, Ill., assignors to CPC International Inc.

No Drawing. Filed July 2, 1968, Ser. No. 741,882

Int. Cl. C09k *3/30*

U.S. Cl. 252—305 4 Claims

This application discloses a fabric de-wrinkler employing an aerosol spray composition which removes wrinkles without the need for pressing or ironing.

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3,600,326

## PREPARATION OF HYDROPHOBIC SILICA AND USE THEREOF

James D. Wilcox, Fallston, and Joel M. Klein, Baltimore, Md., and Frederick A. Hudon, Jr., Bristol, Conn., assignors to the United States of America as represented by the Secretary of the Army

No Drawing. Filed Feb. 27, 1968, Ser. No. 708,493

Int. Cl. B01j *13/00*

U.S. Cl. 252—309 8 Claims

The method for preparing hydrophobic silica, the steps comprising milling a mixture comprising colloidal silica, inert solvent, and silicone with subsequent removal of the said solvent. The hydrophobic silica may be combined with millable substances giving use to a product with high dispersibility.

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3,600,327

## LUBRICATING OIL COMPOSITIONS HAVING IMPROVED SLUDGE DISPERSANCY

Shih-En Hu, Westerfield, N.J., assignor to Esso Research and Engineering Company

No Drawing. Filed Feb. 26, 1969, Ser. No. 802,639

Int. Cl. C10m *1/38*

U.S. Cl. 252—32.7 7 Claims

Mineral lubricating oil compositions are prepared containing oil-soluble additives having improved sludge inhibition and dispersion, antiwear activity, and antioxidant properties under high temperature conditions. The novel additives are prepared by reacting, at between about 215° and about 255° C., elemental sulfur with oil-soluble hydrocarbons containing aliphatic radicals and reacting the sulfurized product with primary, secondary, or tertiary mono, di or poly aliphatic amines or amino alcohols. Sludge dispersing amounts of these additives are employed in the oil compositions and usually range between about 0.05 and about 10.0 wt. percent of the total composition. They are particularly useful in lubricating oil which also contains an antiwear agent, i.e., the zinc salt of a dialkyl dithiophosphate.

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3,600,328

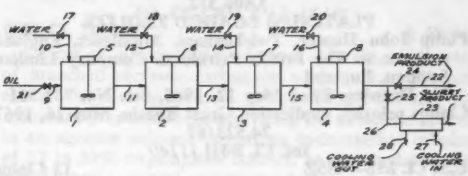
## APPARATUS FOR FORMING EMULSIONS

William C. Lieffers, Fullerton, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Original application Mar. 14, 1966, Ser. No. 533,992. Divided and this application Dec. 10, 1968, Ser. No. 785,855

Int. Cl. B01d; B01f; B01i *13/00*

U.S. Cl. 252—359C 12 Claims




An apparatus for continuously producing an emulsion of immiscible liquids consisting of an elongated shell defining a mixing chamber through which a first liquid chamber along a substantial length of the chamber and means for introducing a second liquid into the mixing chamber along a substantial length of the chamber whereby an emulsion of second liquid in first liquid is formed and then inverted to an emulsion of first liquid in second liquid.

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3,600,329

## DIATOMACEOUS EARTH TREATED WITH POLYELECTROLYTE PRODUCT AND A NEW PROCESS FOR PRODUCING IT

Ernesto Enriquez and Luis Espinosa, Mexico City, Mexico, assignors to Kieselguhr de Mexico, S.A., Mexico City, Mexico

Filed Oct. 29, 1968, Ser. No. 771,554

Claims priority, application Mexico, Oct. 30, 1967, 99,299

Int. Cl. B01j *11/58*

U.S. Cl. 252—428 3 Claims

Diatomaceous earth product for various uses, particularly suitable as a filtering aid with improved filtration and clarification rates, and method of making said product, by adding to the diatomaceous earth prior to, during or after calcination an anionic, non-ionic or cationic polyelectrolyte in amounts ranging from about 5 to about 10,000 p.p.m. of diatomaceous earth.

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3,600,330

## METALLIZATION OF INSULATING SUBSTRATES

Frederick W. Schneble, Jr., and Edward J. Leech, Oyster Bay, and Joseph Polichette, South Farmingdale, N.Y., assignors to Photocircuits Division of Kollmorgen Corporation, Hartford, Conn.

Filed Jan. 3, 1967, Ser. No. 607,036

Int. Cl. C23c *3/00*

U.S. Cl. 252—430 9 Claims

There are provided compositions to render insulting substrates catalytic to electroless metal deposition comprising materials, e.g., solid agents, having deposited thereon a cationic wetting agent in combination with an elemental form of a metal from Groups I–B and VIII of the Periodic Table of Elements, including mixtures of such metals.

3,600,331

## CATALYST CONTAINING COPPER PHOSPHATE AND SILVER PHOSPHATE USEFUL IN THE OXYGENATION OF HYDROGEN HALIDES

Raymond W. Ingwalson, Chattanooga, Tenn., assignor to Velsicol Chemical Corporation, Chattanooga, Tenn.

No Drawing. Filed June 18, 1968, Ser. No. 737,810
Int. Cl. B01j *11/82*
U.S. Cl. 252—437 5 Claims

A catalyst composition which comprises a composite of a catalytic component of a copper phosphate and a silver phosphate and a non-catalytic refractory support. In addition, the catalyst composition can include at least one alkali metal phosphate.

3,600,332

## PLATINUM LOADED ZEOLITE

Philip John Hunter, Twickenham, Middlesex, England, assignor to The British Petroleum Company Limited, London, England

No Drawing. Filed May 22, 1968, Ser. No. 731,311
Claims priority, application Great Britain, May 26, 1967, 24,523/67
Int. Cl. B01j *11/40*
U.S. Cl. 252—455Z 12 Claims

An alkane dehydrogenation catalyst is made by exchanging platinum group metal ions on to a small pore molecular sieve whose pores are at least as small as those of a 5A sieve. The exchange takes place in two or more stages each separated by a drying and reduction step.

3,600,333

## COMPENSATED DETECTOR MATERIAL OF GERMANIUM WITH MERCURY AND GOLD AND METHOD OF COMPENSATING SAME

Richard A. Reynolds, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed July 6, 1967, Ser. No. 651,582
Int. Cl. H01l *3/12*
U.S. Cl. 252—501 3 Claims

A detector material such as mercury sensitized germanium containing acceptor impurity atoms such as copper and Group III elements which have been compensated by a donor impurity such as gold atoms, and a method of compensating the acceptor impurity atoms in the germanium by doping the germanium with gold.

3,600,334

## THORIATED CATHODES AND METHOD FOR MAKING THE SAME

Istvan Koncz, Budapest, Hungary, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Continuation-in-part of application Ser. No. 384,500, July 22, 1964. This application Apr. 23, 1968, Ser. No. 727,136
Int. Cl. H01b *1/00*
U.S. Cl. 252—515 10 Claims

Thoriated hot cathodes in which the metal carbide such as $W_2C$ or $Mo_2C$ is transformed from hexagonal to body centered cubic modification. This is done at an elevated temperature by way of a solid-state reaction, in the presence of a suitable metal catalyst.

3,600,335

## MODIFIED POLYVINYL CHLORIDE FOAMS, PREPARATION THEREOF AND APPLICATIONS THEREFOR

Michio Fukushima, Suita-shi, and Motoshi Mitarai, Nishinomiya-shi, Japan, assignors to Nippon Gohsei Kagaku Kogyo Kabushiki Kaisha, Kita-ku, Osaka-shi, Japan

Filed Dec. 15, 1967, Ser. No. 690,789
Int. Cl. C08f *47/10, 29/24, 45/36*
U.S. Cl. 260—2.5P 3 Claims

Colorless polyvinyl chloride foams of greatly enhanced softness and elasticity, and with greatly improved fineness and uniformity of cell distribution, are obtained by blending 30 to 150 parts by weight of the total amount of a vinyl acetate-ethylene copolymer with a vinyl acetate content of 30% to 80% by weight and a liquid plasticizer in the proportion of 3% to 60% by weight of the former in the total amount of both together with 100 parts by weight of a polyvinyl chloride resin and by heating the obtained resinous mixture to an elevated temperature at which the foaming agent so decomposes as to be foamed.

3,600,336

## POLYAMIDE RESIN FOAM AND A METHOD OF PREPARING THE SAME

Hiroshi Okada and Atsushi Osakada, Ohtsu-shi, Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed Feb. 19, 1968, Ser. No. 706,496
Claims priority, application Japan, Feb. 18, 1967, 42/10,162; May 15, 1967, 42/30,327
Int. Cl. C08g *53/10, 41/04*
U.S. Cl. 260—2.5 10 Claims

A polyamide resin foam comprising a polyamide resin base cross-linked with an organic compound having in the molecule at least two reactive unsaturated double bonds. A method of preparing a polyamide resin foam which comprises uniformly mixing a polyamide with an organic compound having in the molecule at least two reactive unsaturated double bonds and a chemical foaming agent at a temperature higher than the softening point of said polyamide, irradiating said mixture with ionizing rays to effect a cross-linking of the polyamide, and heating the mixture to a temperature higher than the decomposition temperature of said foaming agent to cause foaming.

3,600,337

## PROCESS OF MAKING EPOXY CELLULAR PLASTICS

Edgar Fischer and Ernst Nölken, Frankfurt am Main, Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany

No Drawing. Filed Mar. 7, 1968, Ser. No. 711,180
Claims priority, application Germany, Mar. 10, 1967, F 57,786
Int. Cl. C08f *47/10*; C08j *1/16, 1/26*
U.S. Cl. 260—2.5 5 Claims

Epoxy cellular plastics are produced by foaming and curing an epoxy resin in the presence of a blowing agent, an aliphatic or cycloaliphatic polyhydric alcohol and a Lewis acid or an addition- or complex compound of a Lewis acid.

3,600,338

## POLYURETHANE RESINS

Hyman M. Molotsky, Chicago, Ill., assignor to CPC International Inc.

No Drawing. Filed Apr. 2, 1968, Ser. No. 718,195
Int. Cl. C08g *22/14, 22/44*
U.S. Cl. 260—2.5AS 21 Claims

Polyurethane resins formed by reacting an organic polyisocyanate and an alkoxylated starch hydrolysate prepared

by alkoxylating a starch hydrolysate containing at least one reducing saccharide. The resins may be used as coatings or foams, either of the flexible or rigid type, as binders in the foundry process of making cores or molds, or for other uses. Also a method of preparing the above polyurethanes.

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3,600,339

## POLYURETHANE FOAMS FROM HYDROXY PHOSPHONATES

**Charles F. Baranauckas and Irving Gordon, Niagara Falls, N.Y., assignors to Hooker Chemical Corporation, Niagara Falls, N.Y.**

**No Drawing. Division of application Ser. No. 678,157, Oct. 23, 1967, now Patent No. 3,515,776, which is a continuation of application Ser. No. 348,252, Feb. 28, 1964. This application Jan. 3, 1969, Ser. No. 803,513**

**Int. Cl. C08g** *22/44*

**U.S. Cl. 260—2.5** **20 Claims**

Polyurethane foams are made flame retardant by including hydroxy-containing phosphonates in the reaction mixture.

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3,600,340

## POLYURETHANE FOAM

**John T. Patton, Jr., Wyandotte, and Louis C. Pizzini, Trenton, Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.**

**No Drawing. Filed June 30, 1969, Ser. No. 837,882**

**Int. Cl. C08g** *22/44, 41/04, 51/14*

**U.S. Cl. 260—2.5** **2 Claims**

Resilient cellular material comprising a cellular mass of polyurethane and fine particles of polyethylene resin.

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3,600,341

## ABLATIVE CHAR-FORMING COMPOSITIONS CONTAINING AN INTRACTABLE POLYPHENYLENE POLYMER

**Donald L. Schmidt and Paul F. Pirrung, Dayton, Ohio, assignors to the United States of America as represented by the Secretary of the Air Force**

**No Drawing. Filed Nov. 8, 1966, Ser. No. 593,244**

**Int. Cl. C08g** *37/16, 51/08, 51/10*

**U.S. Cl. 260—13** **14 Claims**

This invention contemplates novel plastic compositions, filled plastic composites, and coating materials wherein the said plastic composition is composed of an intimate mixture of intractable polyphenylene polymer and a cross-linkable thermosetting polymer. The invention further contemplates new high temperature, thermal shielding and thermal control uses for the polyphenylene modified polymers and composites, which are made possible by the superior char forming characteristics of the resinous matrix.

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3,600,342

## POLYVINYL ALCOHOL-GLYOXAL-POLYOL ADHESIVE COMPOSITION

**Ralph F. Nickerson and Harold D. Weymouth, Springfield, Mass., assignors to Monsanto Company, St. Louis, Mo.**

**No Drawing. Filed Nov. 12, 1968, Ser. No. 775,146**

**Int. Cl. C09j** *3/16*

**U.S. Cl. 260—17** **17 Claims**

Disclosed herein is an adhesive composition comprising (A) a polyvinyl alcohol resin, (B) glyoxal and (C) a polyol selected from the group consisting of cis 1,2-polyols and certain 1,3-polyols. The adhesive compositions may contain minor amounts of adjuvants such as inert fillers or extenders, methyl cellulose, potassium tripolyphosphate, sodium acetate and mixtures thereof.

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3,600,343

## PROCESS FOR THE MANUFACTURE OF COPOLYMER DISPERSIONS OF HIGH PIGMENT TOLERANCE

**Michael Lederer and Siegfried Sommer, Frankfurt am Main, Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany**

**No Drawing. Continuation of application Ser. No. 586,392, Oct. 13, 1966. This application July 28, 1969, Ser. No. 863,401**

**Int. Cl. C08f** *1/13, 15/40*

**U.S. Cl. 260—17** **6 Claims**

Latices of interpolymers of vinyl chloride, vinyl esters of branched aliphatic carboxylic acids, and acrylic acid esters which show unusual compatibility with dry pigments are prepared by polymerizing the monomer mixture in an aqueous solution containing hydroxyethyl cellulose of 37 to 50% oxyethylene content, an oxyethylated alkyl phenol, and a second anionic emulsifier such as an alkylsulfate or alkylsulfonate salt.

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3,600,344

## HYDROPHYLIC AIR DRYING SYNTHETIC RESINS THAT ARE USEFUL AS BINDERS IN WATER-DILUTABLE LACQUERS AND THEIR METHOD OF PREPARATION WITH BORON AND ITS OXYGEN CONTAINING COMPOUNDS

**Bernhard Broecker and Hans-Joachim Kiessling, Hamburg, Germany, assignors to Reichhold-Albert-Chemie Aktiengesellschaft, Hambury, Germany**

**No Drawing. Filed Feb. 4, 1969, Ser. No. 796,604**

**Claims priority, application Switzerland, Feb. 5, 1968, 1,742/68**

**Int. Cl. C08g** *37/18*

**U.S. Cl. 260—19** **4 Claims**

Water-soluble air drying synthetic resins from drying and/or semi-drying oils comprising:

(a) fatty acid free condensation products of fatty acids, wherein fatty acid which is free of hydroxyl groups and is at least partially unsaturated and has at least 6 carbon atoms, which contain a predominant amount of such fatty acids free of hydroxyl groups or monoketones derived therefrom, is condensed in the presence of a small quantity of boron or of its oxygen-containing compounds as a condensation catalyst to a temperature of between about 230–330° C. with azeotropic removal of the resulting water of reaction and return of the evaporated fatty acids, with the condensation product containing at least 40% of unsaponifiable matter having a mean molecular weight corresponding to the calculated molecular weight of a condensation product of at least 3 molecules of the corresponding fatty acids and the unreacted fatty acids are substantially separated off from the reaction mixture by extraction or distillation;

(b) reacting by heating with such quantities of $\alpha,\beta$-ethylenically unsaturated monocarboxylic and/or polycarboxylic acids and to the extent they exist, their anhydrides;

(c) optionally in the presence of other vinyl or vinylidene compounds;

(d) the reaction products having an acid number of at least 35; and

(e) neutralized at temperatures of below 50° C. with such quantities of ammonia and/or strong nitrogen bases that the reaction products are adequately capable of dispersion in water or dilution with water.

3,600,345
**IMPROVED PREPOLYMER-MODIFIED ALKYD RESINS**
Eli Levine, Union, and Robert F. Singer, Middlesex, N.J., assignors to Celanese Corporation, New York, N.Y.
No Drawing. Filed Sept. 16, 1969, Ser. No. 858,529
Int. Cl. C08g *17/16;* C09d *3/64*
U.S. Cl. 260—22CB 7 Claims

An improved prepolymer-modified alkyd resin is produced by forming the polycondensation product of a polyhydric alcohol (e.g., pentaerythritol), a fatty acid or fatty acid oil (e.g., safflower fatty acids or safflower oil), a polycarboxylic acid or anhydride thereof (e.g., phthalic acid or phthalic anhydride), and a prepolymer derived from (1) a carboxy-substituted, ethylenically unsaturated polymerizable monomer (e.g., methacrylic acid); (2) a hydroxy-substituted, ethylenically unsaturated, polymerizable monomer (e.g., 2-hydroxyethyl methacrylate); and (3) a non-carboxy-non-hydroxy-substituted, ethylenically unsaturated, polymerizable monomer (e.g., methyl methacrylate, ethyl acrylate).

3,600,346
**METHOD AND COMPOSITION FOR OBTAINING PAINTED SURFACES WITH GRAINED AND ANTIQUED EFFECTS**
Carmine A. Spatola, 465 Ocean Parkway Brooklyn, N.Y. 11218
No Drawing. Filed Feb. 12, 1969, Ser. No. 798,779
Int. Cl. C09d *3/48, 3/64, 5/28*
U.S. Cl. 260—22R 15 Claims

Grained and antique finishes are obtained by applying to a surface a paint containing a suspension of the principal pigment in a paint vehicle and also a suspension of a secondary pigment contained in a carrier which is incompatible with the paint vehicle. The initial application of paint provides a coating of the principal pigment. Pressure is then applied to the wet paint to bring out the secondary pigment and provide a grained and antique appearance.

3,600,347
**HOT MELT ADHESIVE FOR POLYETHYLENE**
Joseph Lambert Godar, Jr., Wauconda, Ill., assignor to American Can Company, New York, N.Y.
No Drawing. Filed Dec. 23, 1968, Ser. No. 786,477
Int. Cl. C09j *3/26*
U.S. Cl. 260—27 10 Claims

A hot melt adhesive composition for polyethylene containing a homogeneous mixture of different copolymers of ethylene and vinyl acetate, atactic polypropylene, and plural tackifying resins.

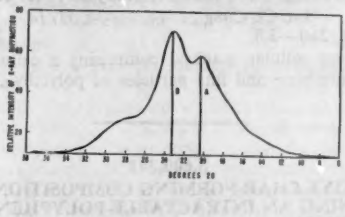
3,600,348
**COATING COMPOSITION FOR WOODEN CONCRETE FORMS AND METHOD OF PREPARING WOODEN FORMS HAVING IMPROVED CONCRETE ANTI-STICKING CHARACTERISTICS**
Earl L. Humphrey, Verona, Pa., assignor to Gulf Research & Development Company, Pittsburgh, Pa.
No Drawing. Filed Sept. 24, 1969, Ser. No. 860,782
Int. Cl. C08f *45/52;* B29c *1/04*
U.S. Cl. 260—28.5A 12 Claims

Wooden concrete forms having improved concrete anti-sticking characteristics are obtained by applying to the concrete-contacting surfaces of the forms a coating composition consisting essentially of a mixture of (1) a hydrocarbon resin derived from a cyclic olefin such as a resin of dicyclopentadiene; (2) mineral oil having a viscosity of about 100 to about 1000 SUS at 100° F.; (3) paraffin wax having a melting point of about 120° to about 155° F.; and (4) a hydrocarbon distillate solvent, e.g., Stoddard solvent, kerosene, etc.

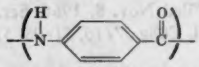
3,600,349
**METHOD FOR CONTROLLING REACTION RATE IN AQUEOUS EMULSION POLYMERIZATION TO FORM ELASTOMERIC POLYMERS**
John M. Stone, Baton Rouge, La., assignor to Copolymer Rubber & Chemical Corporation, Baton Rouge, La.
Filed May 1, 1969, Ser. No. 820,868
Int. Cl. C08d *7/00, 1/09;* B08f *1/13*
U.S. Cl. 260—29.7 7 Claims

Means and method for controlling reaction rate in the polymerization to form elastomeric polymers and copolymers of butadiene in which use is made of a pre-reactor in advance of the reaction vessels through which the monomeric materials are caused to flow with a small fraction of the catalyst and measurement is made of the temperature rise generated by the exothermic reaction for adjustment of the catalyst additions to control reaction rate.

3,600,350
**POLY(p-BENZAMIDE) COMPOSITION, PROCESS AND PRODUCT**
Stephanie Louise Kwolek, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.
Continuation-in-part of application Ser. No. 644,851, June 9, 1967, which is a continuation-in-part of application Ser. No. 556,934, June 13, 1966. This application Apr. 20, 1970, Ser. No. 30,090
Int. Cl. C08g *20/00, 51/44*
U.S. Cl. 260—32.6 21 Claims



High molecular weight polymers consisting essentially of recurring units of the formula



and certain copolymers thereof are useful for the production of fibers having a high initial modulus.

3,600,351
**INTERCONNECTED RUBBERS STABILIZED WITH BORATES**
Jerry Donald Hunt, Cuyahoga Falls, and Robert Paul Spitz, Akron, Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio
No Drawing. Filed June 18, 1969, Ser. No. 834,541
Int. Cl. C08d *5/02, 11/04*
U.S. Cl. 260—33.6AQ 6 Claims

Unvulcanized rubbery interconnected polymers derived from linear homopolymers of conjugated dienes of 4 and 5 carbon atoms and linear copolymers thereof with olefins, are stabilized with trialkyl and triaryl borates.

3,600,352
**SILICONE CONSTRUCTION SEALANT**
George M. DuJack, Troy, N.Y., assignor to General Electric Company
No Drawing. Filed June 10, 1968, Ser. No. 735,589
Int. Cl. C08g *47/04*
U.S. Cl. 260—37 6 Claims

A construction sealant contains a silicone resin and microcrystalline magnesium silicate fibers.

3,600,353

## MODIFIED RESORCINOL-BASED ADHESIVE

Edgar Bradbury Baker, Springfield, Oreg., assignor to Borden, Inc., New York, N.Y.

No Drawing. Filed Mar. 21, 1969, Ser. No. 809,391

Int. Cl. C08g *51/04, 37/16*

U.S. Cl. 260—38 5 Claims

This invention relates to a method of gluing wood, wood articles and the like with resorcinol-based resin adhesives, said adhesives comprising a resorcinol-based resin and a vinyl acetate polymer in an amount up to about 10% of the resorcinol-based resin solids and the method comprising applying the thus modified adhesive at a total solids level corresponding to between about 80% and about 90% of the level normally required in the case of resorcinol-based resin adhesives not containing vinyl acetate polymers whereby boil-proof and weather-resistant bonds are created not substantially different from the bonds obtainable with the unmodified resorcinol-based resin under the same conditions of assembly and cure.

3,600,354

## PIGMENT/POLYMER CONCENTRATE AND METHOD FOR ITS PREPARATION AND USE

Ernst-Guenter Kunze, Frankfurt am Main, Rudi Groepler, Schoneberg, Taunus, Robert Lauerbach-Lehmeier, Frankfurt am Main, and Herbert Toepper, Oberts-hausen, Germany, assignors to Vickers-Zimmer Aktien-gesellschaft Planung und Bau von Industrieanlagen

No Drawing. Filed Aug. 23, 1968, Ser. No. 754,974

Claims priority, application Germany, Sept. 7, 1967, V 34,399

Int. Cl. C08b *27/02*; C08f *45/02*; C08g *51/02*

U.S. Cl. 260—40 12 Claims

A pigment/polymer concentrate and method for its preparation comprising treating solid polymer particles to roughen the surfaces thereof, incorporating pigment into said roughened surfaces at a temperature below the softening temperature of said polymer, forming larger concentrate granules by heating and agitating the treated polymer particles at a temperature between the softening temperature and the melting temperature of said polymer to sinter the treated polymer particles together at their contact surfaces with inclusion of further pigment particles therebetween. The term "pigment" includes other particulate conventional additives.

3,600,355

## ABS AND HYDROCARBON POLYMERS STABILIZED WITH BORON ESTER-BENZOTRIAZOLE MIXTURES

Henryk A. Cyba, Evanston, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

No Drawing. Division of application Ser. No. 710,782, Mar. 6, 1968, now Patent No. 3,518,193, which is a continuation-in-part of applications Ser. No. 367,854, May 15, 1964, now Patent No. 3,382,208, and Ser. No. 559,410, June 22, 1966, now Patent No. 3,445,422, the latter being a division of application Ser. No. 366,921, May 12, 1964, now Patent No. 3,301,888. This application Dec. 4, 1969, Ser. No. 882,290

Int. Cl. C08f *45/60*

U.S. Cl. 260—45.8N 18 Claims

Solid polymer stabilized against deterioration due to one or both of ultraviolet light or oxidative deterioration containing, as an inhibitor against said deterioration, a stabilizing concentration of a synergistic mixture of about 10% to about 90% by weight of a boron ester of N,N-dihydrocarbyl-alkanolamine or boron ester of polyalkyl- or polycyclo - alkylpolyhydroxyalkyl - alkylenepolyamine and about 10% to about 90% by weight of an N-hydroxyphenyl-benzotriazole.

3,600,356

## LIQUID CURING AGENTS FOR POLYEPOXIDES COMPRISED OF A MIXTURE OF ISOMERS OF TETRAHYDROPHTHALIC ANHYDRIDE AND HEXAHYDROPHTHALIC ANHYDRIDE

Koichi Murai, Kyoto-fu, and Giichi Akazome, Yasuto Murakami, Koichi Tabata, Yoshio Oka, and Akira Fujita, Kyoto-shi, Japan, assignors to New Japan Chemical Company Limited, Kyoto-shi, Japan

No Drawing. Filed Mar. 24, 1969, Ser. No. 809,982

Claims priority, application Japan, Apr. 6, 1968, 43/22,976

Int. Cl. C08g *30/12*

U.S. Cl. 260—47 3 Claims

A liquid curing agent for polyepoxide which comprises a mixture of the isomers of tetrahydrophthalic anhydride having a solidifying point of 5 to 20° C. and 5 to 60 weight percent of hexahydrophthalic anhydride, based on the combined weight of said isomer mixture and hexahydrophthalic anhydride.

3,600,357

## OPTICALLY BRIGHTENED POLYESTERS CONTAINING SEGMENTS DERIVED FROM 2,5-DIMETHOXYCINNAMIC ACID

Mary J. Stewart, Riddlewood, Media, and John A. Price, Swarthmore, Pa., assignors to FMC Corporation, Philadelphia, Pa.

No Drawing. Filed Apr. 18, 1969, Ser. No. 817,552

Int. Cl. C08g *17/08, 17/14*

U.S. Cl. 260—47 3 Claims

A copolyester resin comprising the condensation product of (a) a saturated dicarboxylic acid or its lower alkyl diester, (b) a lower aliphatic glycol, and (c) a minor proportion of 2,5-dimethoxycinnamic acid or its lower alkyl ester.

3,600,358

## POLYURETHANE-UREA ELASTOMERS PREPARED FROM 4,4'-METHYLENE BIS (CYCLOHEXYL-ISOCYANATE), NEOPENTYL ADIPATE AND AN AROMATIC DIAMINE

Bernard Taub, Williamsville, N.Y., assignor to Allied Chemical Corporation, New York, N.Y.

No Drawing. Filed Jan. 28, 1969, Ser. No. 794,770

Int. Cl. C08g *22/10*

U.S. Cl. 260—75NH 10 Claims

Polyurethane elastomers having improved hydrolytic stability are prepared from 4,4'-methylene bis(cyclohexyl-isocyanate), neopentyl adipate polyester and an aroamtic diamine.

3,600,359

## NOVEL THIOURETHANE-URETHANE ACRYLATES

Thomas J. Miranda, Granger, Ind., assignor to The O'Brien Corporation, South Bend, Ind.

No Drawing. Filed Nov. 21, 1968, Ser. No. 777,914

Int. Cl. C08g *22/04*

U.S. Cl. 260—77.5 18 Claims

A radiation curable compound is produced by reacting a polymercapto compound, a stoichiometric excess of a polyisocyanate (determined on the basis of the mercapto groups) and a hydroxy acrylate.

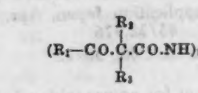
3,600,360

## METHOD OF MANUFACTURING POLYAMIDES BY ALKALINE POLYMERIZATION OF LACTAMS HAVING AN AT LEAST 7-MEMBERED RING

Zbyněk Bukač, Jiří Tomka, and Jan Šebenda, Prague, Czechoslovakia, assignors to Ceskoslovenska Akademie Ved, Prague, Czechoslovakia

No Drawing. Filed July 12, 1968, Ser. No. 744,338
Claims priority, application Czechoslovakia, July 18, 1967, 5,276/67, 5,277/67
Int. Cl. C08g 20/18
U.S. Cl. 260—78L 6 Claims

The method consists in carrying out the known alkaline polymerization of lactams, having an at least seven-membered ring, in the presence of a compound of the general formula



wherein X is the rest of the used amine with *n* amino groups, $R_1$, $R_2$ and $R_3$ are alkyl, cycloalkyl, aryl or aralkyl groups with 1 to 18 carbon atoms, either separated or forming together a ring, *n* is an integer, and either $R_2$ or $R_3$ can be also a hydrogen atom, if *n* is greater than 1.

The rest X can be either plain or substituted hydrocarbon radical such as alkylene, arylene, dialkyl ether, dialkyl thioether, diaryl thioether, diarylsulfone, dialkyl amine, diaryl amine, polyvinyl- or polystyryl rest derived from the corresponding amine with *n* amino groups. Any substituent on the rest X, which does not interfere with activated alkaline polymerization of lactams can be used, that is any chemically inert, non-acidic substituent such as alkyl, alkoxyl and the like.

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3,600,361

## PROCESS FOR DRYING POLYAMIDE-ACID/IMIDE FILM

James Flaviel Heacock, Circleville, Ohio, and Arthur Walter Sweeney, North Tonawanda, N.Y., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed June 11, 1969, Ser. No. 832,081
Int. Cl. C08g 20/32
U.S. Cl. 260—78TF 6 Claims

A process is provided for drying polyamide-acid/imide film wherein a gel-film structure is subjected to the simultaneous action of heat and pressure as by passing a gel-film of 9.5 mil thickness through a 4 mil nip of a pair of rotating nip rolls at a temperature of about 250° C. thereby to obtain a polyimide film.

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3,600,362

## EPOXY RESIN CURED WITH LIQUID RESINOUS AMINE CURING AGENTS

Frank N. Hirosawa, Monterey Park, Calif., assignor to Furane Plastics Incorporated, Los Angeles, Calif.

No Drawing. Filed June 12, 1969, Ser. No. 832,863
Int. Cl. C08g 51/04
U.S. Cl. 260—37EP 3 Claims

An uncured epoxy resin composition is prepared by mixing an uncured epoxy resin and a resinous liquid and hardening agent which has been prepared by reacting an aromatic polyamine with an active aldehyde compound in proportions which yield a resinous liquid product which selectively may be of low to high viscosity, which uncured epoxy mixture has a long working life, and upon curing yields a cured epoxy resin of unusually high resistance to high temperatures.

3,600,363

## POLYAMIDE HAVING CYCLOHEXANE RING PREPARED BY POLYMERIZING 4-AMINOMETHYL-CYCLOHEXANE-1-CARBOXYLIC ACID IN THE PRESENCE OF WATER

Shigeyuki Suzuki, Kanagawa, and Hitoshi Takita, Masaaki Takahashi, and Kiro Asano, Tokyo, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

No Drawing. Filed June 26, 1969, Ser. No. 836,969
Claims priority, application Japan, June 26, 1968, 43/44,107
Int. Cl. C08g 20/00, 20/02, 20/12
U.S. Cl. 260—78 8 Claims

A process for producing a polymer of 4-aminomethylcyclohexane-1-carboxylic acid, or a copolymer of the acid with ε-caprolactam including conducting the polymerization in the presence of from 20 to 150% water, and at a temperature of from 180 to 340° C.

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3,600,364

## PROCESS OF PREPARING ETHYLENE COPOLYMERS

Haider Beg Mirza and Semih Zaim, Sarnia, Ontario, Canada, assignors to Polymer Corporation, Sarnia, Ontario, Canada

Filed Oct. 19, 1967, Ser. No. 676,523
Claims priority, application Canada, Oct. 24, 1966, 973,877
Int. Cl. C08f 15/40
U.S. Cl. 260—80.78 6 Claims

Rubbery amorphous copolymers of ethylene and at least one other olefin are prepared in a continuous system by feeding the reactant in liquid feed streams to a rapidly agitated reactor, the residence time in the reactor being from six seconds to six minutes and the reaction temperature being maintained by pre-cooling of the feed prior to entry into the reactor.

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3,600,365

## POLYESTERS FROM POLYCARBOXYLATES AND POLYHALIDES

Donnie G. Brady, Bartlesville, Okla., assignor to Phillips Petroleum Company

No Drawing. Filed Aug. 19, 1969, Ser. No. 851,482
Int. Cl. C08g 17/013, 17/04
U.S. Cl. 260—78.4 14 Claims

Preparation of polyesters from organic polyhalides and salts of polycarboxylic acids in effective yield in short reaction times by using, as catalysts, phosphines or quaternary phosphonium salts. The method optionally uses a soluble monohalide with the phosphines for further increases in polyester yield.

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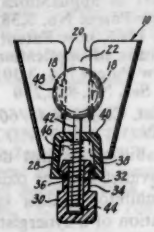
3,600,366

## BLEACHING OF POLYMALEATE HOMOPOLYMERS AND COPOLYMERS

David C. Heckert, Oxford, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

No Drawing. Filed Dec. 10, 1969, Ser. No. 884,001
Int. Cl. C08f 1/88, 3/70
U.S. Cl. 260—78.4R 9 Claims




The bleaching of polymaleate homopolymers and copolymers by the process which comprises treating a poly-

maleate material with chlorine dioxide in the presence of an aqueous solvent.

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3,600,367

## PROCESS AND CATALYSTS WHICH ARE SUPPORTED ON PARTIALLY UNSATURATED MACROMOLECULAR COMPOUNDS FOR THE POLYMERIZATION AND COPOLYMERIZATION OF OLEFINS AND THE RESULTANT POLYMERS AND COPOLYMERS

Andre Delbouille, Brussels, and Jean-Louis Derroitte, Barvaux-sur-Ourthe, Belgium, assignors to Solvay & Cie, Brussels, Belgium

Filed Feb. 21, 1967, Ser. No. 617,598
Claims priority, application Belgium, Feb. 23, 1966, 24,410; May 23, 1966, 28,431, Patent 681,400
Int. Cl. C08f *3/02, 15/04*
U.S. Cl. 260—80.78 14 Claims

Olefins are polymerized and copolymerized in the presence of a catalyst constituted of the reaction product of one or more transition metal compounds, and a macromolecular compound containing carbon-carbon double bonds in its molecule and an activator which is a metal, a hydride or an organo-metallic compound of metals of Groups I to III of the Periodic Table.

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3,600,368

## PROCESS FOR THE MANUFACTURE OF AMORPHOUS COPOLYMERS

Helmut Schaum, Bad Soden, Taunus, and Hans Emde and Kurt Benedikter, Marl, Germany, assignors to Bunawerke Huls Gesellschaft mit beschrankter Haftung, Marl, Germany

Filed Apr. 1, 1968, Ser. No. 717,760
Claims priority, application Germany, Apr. 5, 1967, F 52,030
Int. Cl. C08f *15/40*
U.S. Cl. 260—80.78 14 Claims

The present invention relates to a process for the manufacture of copolymers from ethylene and higher α-olefins in suspension with modified organometal mixed catalyst. The mixed catalysts are modified by the addition of certain amounts of a perchlorocrotonic acid halide or ester respectively. This modification results in a catalyst system which is active enough as to avoid an aqueous working-up procedure and regeneration of the solvent.

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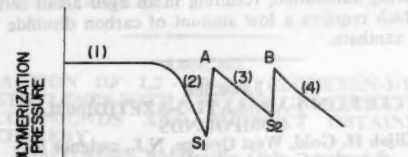
3,600,369

## PRODUCTION AND POWDER COATING OF POLYVINYLIDENE FLUORIDE POLYMER MATERIALS

Yasushi Toyoda, Hajime Ishii, and Nobuo Bannai, Iwakishi, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo-to, Japan

Filed July 11, 1967, Ser. No. 656,308
Claims priority, application Japan, July 15, 1966, 41/45,897; Apr. 14, 1967, 42/23,743
Int. Cl. C08f *1/11, 3/22*
U.S. Cl. 260—92.1 1 Claim




Suspension polymerization at a temperature below 40 degrees C. of a vinylidene fluoride monomer substance with at least one intermediate charge of supplementary vinylidene fluoride monomer at a time when the polymerization pressure drops is carried out to produce vinylidene fluoride polymer materials in the form of spherical particles having intrinsic viscosities of from 0.4 to 1.2, particle size distributions in the range of from 5 to 300 microns, and apparent densities of from 0.3 to 0.7 gram/cc. and having high suitability for powder coating to form film coatings having good properties.

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3,600,370

## POLYMERIZATION PROCESS AND CATALYST SYSTEM

Lawrence M. Fodor, Bartlesville, Okla., assignor to Phillips Petroleum Company

No Drawing. Filed Oct. 10, 1968, Ser. No. 766,635
Int. Cl. C08f *1/56, 3/10*
U.S. Cl. 260—93.7 6 Claims

Utilization of a catalyst system formed by admixing (a) a compound of the formula $R_nAlX_{3-n}$; (b) a titanium trichloride-aluminum trichloride complex of the approximate formula $TiCl_3 \cdot 1/3\ AlCl_3$; and (c) a tetrakis (haloalkyl) phosphonium halide of the formula $[(XR')_4P^+]X^-$ in the polymerization of 1-olefins results in the production of polymers having improved properties. In the above formulas, R is selected from alkyl, cycloalkyl and aryl groups, and combinations thereof, having from 1 to 12 carbon atoms, R' is an alkylene group containing 1 to 4 carbon atoms, *n* is 1, 2 or mixtures thereof, and X is halogen.

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3,600,371

## RECOVERY OF POLYETHYLENE FROM SOLUTION

Stanley J. Marwil, Bartlesville, Okla., assignor to Phillips Petroleum Company

Filed Nov. 12, 1968, Ser. No. 774,726
Int. Cl. C08f *1/88*
U.S. Cl. 260—94.9 6 Claims

In the recovery of a normally solid polymer from a solution thereof by flashing into a low-pressure chamber containing a chopper wherein the solvent vaporizes and the precipitated polymer is chopped into small particles, there is provided the improvement of controlling temperature in the chamber by injection of liquid solvent in response to chamber temperature.

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3,600,372

## CARBON DISULFIDE TREATED MANNICH CONDENSATION PRODUCTS

John H. Udelhofen, Glenwood, Ill., and Roger W. Watson, Highland, Ind., assignors to Standard Oil Company, Chicago, Ill.

No Drawing. Filed June 4, 1968, Ser. No. 734,229
Int. Cl. C07g *17/00;* C10m *1/38*
U.S. Cl. 260—132 8 Claims

An ashless dispersion for lubricant which is made by reacting carbon disulfide or carbon disulfide and an alkali metal hydroxide with a Mannich condensation product.

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3,600,373

## CONVERSION PRODUCTS OF COMPLEX METAL COMPOUNDS OF AZO DYESTUFFS WITH A BASIC DYESTUFF

Christian Zickendraht, Binningen, and Alfred Fasciati, Bottmingen, Switzerland, assignors to Ciba Limited, Basel, Switzerland

No Drawing. Filed Jan. 16, 1968, Ser. No. 698,109
Claims priority, application Switzerland, Jan. 25, 1967, 1,071/67
Int. Cl. C09b *45/16, 45/20;* D06p *1/10*
U.S. Cl. 260—146R 7 Claims

The invention relates to conversion products of complex metal compounds of azo dyestuffs which contain a basic dyestuff and a complex metal compound of an azo dyestuff free from sulphonic acid groups and also free

from carboxyl groups not in vicinal position to an azo bridge and which contains a sulphonic acid-N-alkoxyalkylamide group. Said conversion products are suitable for dyeing or coloring natural or synthetic resins, waxes, lacquers and plastic compositions and show good fastness to light.

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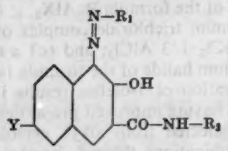
**3,600,374**
**PHENYL-AZO-NAPHTHOIC ACID AMIDE PIGMENTS CONTAINING A NAPHTHOSTYRIL GROUP**
**Rudolf Mory, Dornach, Switzerland, assignor to Ciba Limited, Basel, Switzerland**
**No Drawing. Filed Mar. 1, 1968, Ser. No. 709,828**
**Claims priority, application Switzerland, Mar. 6, 1967, 3,239/67**
**Int. Cl. C07c** *107/08;* **C09b** *29/20*
**U.S. Cl. 260—152** **9 Claims**

Monoazo dyestuffs of the formula



in which Y represents a hydrogen or a halogen atom or an alkoxy or cyano group, $R_2$ represents a naphthostyril radical and $R_1$ represents a benzene radical are valuable pigments which color plastic masses red shades of excellent fastness to light and migration.

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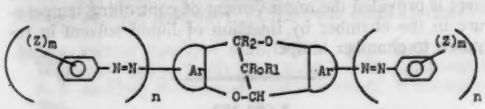
**3,600,375**
**AZOMETHANODIOXOCINS**
**Chun-Shan Wang, Midland, and Henry E. Hennis, Coleman, Mich., asssignors to The Dow Chemical Company, Midland, Mich.**
**No Drawing. Filed Mar. 25, 1968, Ser. No. 715,488**
**Int. Cl. A61l** *13/00;* **C07c** *107/00;* **C09b** *29/00*
**U.S. Cl. 260—152** **13 Claims**

Azomethanodioxocins having the formula



where Ar is a homocyclic or heterocyclic substituted or unsubstituted aromatic ring; *m* and *n* are integers of from 0 to 2 inclusive; $R_0$ is H; $R_1$ is H, aryl or alkyl; $R_0$ and $R_1$ may together with the C to which they are attached form the cyclohexane ring; $R_2$ is H, aryl or alkyl and Z is hydroxy or a dialkylamino group, are produced by a process comprising reacting by contacting the appropriate diazonium salt with the appropriate phenol or N,N-dialkylaniline. The new azomethanodioxocins have bacteriocidal activity and are excellent dyes and pH indicators.

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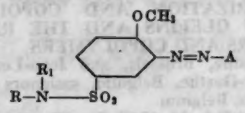
**3,600,376**
**METHOD OF PREPARING J-ACID UREA DISAZO DYESTUFFS**
**Richard C. Franklin, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.**
**No Drawing. Filed Oct. 3, 1968, Ser. No. 764,966**
**Int. Cl. C09b** *35/26;* **D06p** *1/04;* **D21h** *1/46*
**U.S. Cl. 260—175** **4 Claims**

Direct bis(arylazo- and sulfoarylazo)-J-acid urea dyestuffs, useful for dyeing cellulosic materials, their preparation by a process which comprises coupling an aryl or sulfoaryl diazonium compound to J-acid urea in a neutral to alkaline aqueous medium to which is added a lithium base selected from the hydroxide, bicarbonate and carbonate, and stable, uniform, aqueous, dye pastes of said dyes.

**3,600,377**
**MONOAZO DYES FOR NYLON**
**Hans Alfred Stingl, Brookside Heights, N.J., assignor to Toms River Chemical Corporation, Toms River, N.J.**
**No Drawing. Filed Jan. 16, 1968, Ser. No. 698,134**
**Int. Cl. C09b** *29/16;* **D06p** *1/02*
**U.S. Cl. 260—200** **3 Claims**

Compounds of the formula



wherein A is a coupling component containing a sulfonic acid group and R and $R_1$ are hydrogen or alkyl groups of 2–6 carbon atoms with the proviso that only one of R and $R_1$ is hydrogen, provide yellow to red dyeings of good fastness properties and excellent leveling characteristics on synthetic polyamide fibers.

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**3,600,378**
**METHOD FOR THE PURIFICATION OF LIPOPOLYSACCHARIDES**
**David G. Marsh and Michael J. Crutchley, both of 183–193 Euston Road, London, NW. 1, England**
**No Drawing. Filed Oct. 17, 1967, Ser. No. 675,781**
**Claims priority, application Great Britain, Oct. 27, 1966, 48,317/66**
**Int. Cl. C12d** *13/00*
**U.S. Cl. 260—209** **17 Claims**

A process for the preparation of a purified non-toxic lipopolysaccharide, which comprises precipitating the lipopolysaccharides with a salt from the culture supernatant of Gram-negative bacteria, grown under conditions of vigorous aeration, redissolving the lipopolysaccharides, dialysing the redissolved precipitate, applying the solution of the lipopolysaccharides to an anionic exchanger preferentially retaining the toxic lipopolysaccharide (endotoxin) until the eluted and isolated product is substantially homogenous and non-toxic.

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**3,600,379**
**PROCESS FOR MAKING VISCOSE**
**Hannes Sihtola, Fiilimaki 30 A, and Boris Nizovsky, Gyldenintie 14 A, both of Helsinki, Finland**
**No Drawing. Filed May 16, 1969, Ser. No. 825,390**
**Claims priority, application Finland, May 24, 1968, 1,466/68; July 17, 1968, 2,036/68**
**Int. Cl. C08b** *9/00*
**U.S. Cl. 260—217** **6 Claims**

Process for manufacturing viscose including the step of re-steeping and pressing aged alkali cellulose with a sodium hydroxide solution, the concentration of which is less than 15% by weight, prior to reacting the alkali cellulose with carbon disulfide. The re-steeping and pressing steps reduce the amount of sodium hydroxide in the aged alkali cellulose. The amount of sodium hydroxide in the alkali cellulose is maintained at less than 15 wt. percent during xanthation, resulting in an aged alkali cellulose which requires a low amount of carbon disulfide to yield a xanthate.

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**3,600,380**
**CERTAIN 1-ARALKYL-3-AZETIDINOL COMPOUNDS**
**Elijah H. Gold, West Orange, N.J., assignor to Schering Corporation, Bloomfield, N.J.**
**No Drawing. Filed May 10, 1968, Ser. No. 728,335**
**Int. Cl. C07d** *25/00*
**U.S. Cl. 260—239A** **10 Claims**

Novel 1-(α-alkylphenethyl)-3-azetidinols and pharmaceutically acceptable ester and ether derivatives thereof are disclosed. The compounds are effective as stimulants with reduced autonomic side effects. Certain of these compounds are also useful as anorectics.

3,600,381
**CAPROLACTAM PURIFICATION PROCESS**
**Akira Yamamoto, Makoto Yasuda, and Yutaka Furusawa, Mihara-shi, Hiroshima-ken, Japan, assignors to Teijin Limited, Kita-ku, Osaka, Japan**
**No Drawing. Filed Apr. 21, 1969, Ser. No. 818,155**
**Claims priority, application Japan, May 9, 1968, 43/31,291**
**Int. Cl. C07d** *41/06*
**U.S. Cl. 260—239.3** **4 Claims**

A method for the preparation of pure lactam from an oligomer-containing crude lactam by evaporating said oligomer-containing crude lactam at a temperature less than the evaporation temperature of said lactam while maintaining said lactam under alkaline conditions and then rectifying said oligomer-containing crude lactam. Further purification of the crude lactam remaining after rectification can be carried out by depolymerization of said crude lactam in the presence of an acidic catalyst at a temperature within the range from about 220° C. to about 350° C. and at a pressure within the range from about 0.5 to about 6 atmospheres, separating a lactam aqueous solution, oxidizing said lactam aqueous solution until the permanganate number of the lactam is below 1.50, reducing the water content from said lactam aqueous solution to at least about 5%, and recirculating said lactam aqueous solution to said evaporating step.

3,600,382
**$\Delta^{4,20,22}$-BUFATRIENOLIDES**
**Walter Steidle, Limburgerhof, Germany, assignor to Knoll A.G. Chemische Fabriken, Ludwigshafen (Rhine), Germany**
**No Drawing. Filed Jan. 13, 1969, Ser. No. 790,851**
**Claims priority, application Germany, Jan. 16, 1968, P 16 68 356.0**
**Int. Cl. C07c** *173/04*
**U.S. Cl. 260—239.57** **23 Claims**

$\Delta^{4,20,22}$-bufatrienolides substituted in the 3$\alpha$- and 3$\beta$-positions by alkoxy, hydroxyalkoxy, cycloalkoxy, benzyloxy and 2-oxacycloalkoxy moieties are disclosed as novel cardioactive compounds, as well as a method for their preparation by reaction of 3-hydroxy- and 3-glycosido-$\Delta^{4,20,22}$-bufatrienolides with appropriate hydroxy compounds or 2,3-oxacycloalkenyl ethers.

3,600,383
**OXADIAZOLE COMPOUNDS**
**John Reginald Atkinson and Eric Hemingway, Manchester, England, assignors to Imperial Chemical Industries Limited, London, England**
**No Drawing. Filed July 29, 1968, Ser. No. 748,171**
**Claims priority, application Great Britain, Aug. 15, 1967, 37,407/67**
**Int. Cl. C07d** *85/54*
**U.S. Cl. 260—240** **1 Claim**

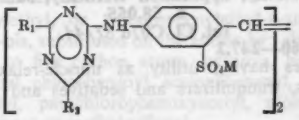
Substituted mono- or bis-1,3,4-oxadiazoles in which at least one substituent is a polycyclic aromatic hydrocarbon group having at least three fused rings, a process for their manufacture and their use as fluorescent brightening agents for polymeric materials.

3,600,384
**REACTION OF 1,2 - BIS(3-CYCLOHEXEN-1-YL) ETHYLENES WITH CERTAIN UNSATURATED COMPOUNDS AND PRODUCT OBTAINED THEREBY**
**Hans D. Holtz, Bartlesville, Okla., assignor to Phillips Petroleum Company**
**No Drawing. Continuation-in-part of abandoned application Ser. No. 502,293, Oct. 22, 1965. This application Nov. 15, 1968, Ser. No. 776,265**
**Int. Cl. C07c** *53/28*
**U.S. Cl. 260—240** **3 Claims**

1,2-bis(3-cyclohexen-1-yl)ethylenes are reacted with unsaturated compounds such as maleic anhydride to produce novel compounds which are useful as curing agents for epoxy resins, as components of alkyl resins and the like, and as starting materials for the production of polyimide resins.

3,600,385
**BIS-(TRIAZINYLAMINO) STILBENE DERIVATIVES FOR OPTICAL BRIGHTENING**
**Frank Fred Loffelman, Middlesex, and Leroy Michael Konzelman, Livingston, N.J., assignors to American Cyanamid Company, Stamford, Conn.**
**No Drawing. Filed Dec. 16, 1968, Ser. No. 784,250**
**Int. Cl. C07d** *55/22*
**U.S. Cl. 260—240** **7 Claims**

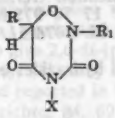
A new class of ditriazinyl derivatives is provided which are particularly useful as optical brighteners for cellulosics. The compounds are the bis-(triazinylamino)stilbenes represented by the following general formula:



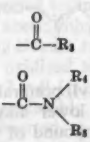
wherein $R_1$ is the residue of a 3-[(mono- or dihydroxyalkyl)amino]propionamide in which the 3-amino nitrogen is attached to the triazine nucleus; $R_2$ is a member selected from the group consisting of lower alkoxy, arylamino and the residue of a 3-[(mono- or dihydroxyalkyl)amino]propionamide in which the 3-amino nitrogen is attached to the triazine nucleus; and M is a cation selected from the group consisting of hydrogen, sodium, potassium, lithium, ammonium, and substituted ammonium. A novel and useful class of aliphatic amine intermediates is also disclosed.

3,600,386
**4-SUBSTITUTED OXADIAZINEDIONES**
**George Levitt, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.**
**No Drawing. Filed Mar. 12, 1969, Ser. No. 806,686**
**Int. Cl. C07d** *87/32*
**U.S. Cl. 260—244** **10 Claims**

The 4-substituted oxadiazinediones of the formula



wherein R is hydrogen or methyl; $R_1$ is hydrogen, alkyl of 1 through 6 carbon atoms or phenyl; and X is —S—$R_2$,



—$CH_2$—X—$R_6$, phenoxyacetyl; or acetoacetyl are useful as plant growth regulants. Representative of the oxadiazinediones of the above formula are

6-methyl-4-(trichloromethylthio)-2H-1,2,4-oxadiazine-3,5-(4H,6H)-dione;
4-benzoyl-6-methyl-2H-1,2,4-oxadiazine-3,5-(4H,6H)-dione;
4-trichloroacetyl-6-methyl-2H-1,2,4-oxadiazine-3,5-(4H,6H)-dione;
4,4'-oxalylbis[6-methyl-2H-1,2,4-oxadiazine-3,5-(4H,6H)-dione];

6-methyl-4-(p-chlorophenylcarbamoyl)-2H-1,2,4-oxadiazine-3,5-(4H,6H)-dione;
4,4'-carbonylbis[6-methyl-2H-1,2,4-oxadiazine-3,5-(4H,6H)-dione];
6-methyl-4-(o-fluorophenylcarbamoyl)-2H-1,2,4-oxadiazine-3,5-(4H,6H)-dione; and
6-methyl-4-(hydroxymethyl)-2H-1,2,4-oxadiazine-3,5-(4H,6H)-dione.

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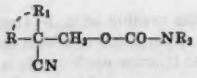
**3,600,387**

## PIPERIDINO OR MORPHOLINO-2-PHENYL-2-CYANO-BUTYL URETHANES

**Laszlo Surnyi, Mannheim, Germany, assignor to Knoll A.G., Ludwigshafen (Rhine), Germany**

**No Drawing. Original application Dec. 27, 1966, Ser. No. 604,638, now Patent No. 3,506,702, dated Apr. 14, 1970. Divided and this application July 2, 1969, Ser. No. 869,981**
**Claims priority, application Germany, Jan. 3, 1966, K 58,055**
**Int. Cl. C07d *87/44***
**U.S. Cl. 260—247.2** **2 Claims**

Urethanes having utility as muscle-relaxants, antispasmodics, tranquilizers and sedatives and having the formula



in which R is a straight or branched chain alkyl of 1 to 6 carbon atoms; $R_1$ is a straight or branched chain alkyl of 1 to 6 carbon atoms, phenyl, or phenyl mono- or disubstituted by halogen, trifluoromethyl, nitro, alkyl of 1 to 3 carbon atoms or alkoxy of 1 to 3 carbon atoms; R and $R_1$ together are divalent alkylene of 3 to 5 carbon atoms; and $NR_2$ stands for piperidino or morpholino.

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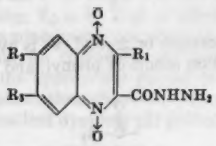
**3,600,388**

## QUINOXALINE-1,4-DIOXIDES

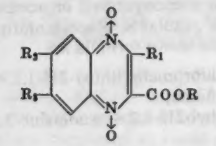
**Walter Durckheimer, Hattersheim (Main), and Elmar Schrinner, Wiesbaden, Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany**

**No Drawing. Filed July 7, 1969, Ser. No. 839,646**
**Claims priority, application Germany, July 25, 1968, P 17 70 975.0**
**Int. Cl. C07d *51/78***
**U.S. Cl. 260—250** **6 Claims**

New carboxylic acid hydrazides of the general formula



in which $R_1$ is lower alkyl, preferably methyl, and $R_2$ and $R_3$ represent hydrogen, lower alkyl or alkoxy, are prepared by reacting a compound of the formula



in which R is alkyl, with hydrazine hydrate under mild reaction conditions. The products of the invention have an antibacterial activity.

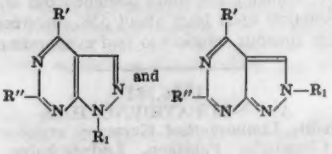
**3,600,389**

## N-SUBSTITUTED PYRAZOLO-PYRIMIDINES

**Jean Druey, Rieben, and Paul Schmidt, Therwil, Switzerland, assignors to Ciba Corporation, Summit, N.J.**

**No Drawing. Continuation of application Ser. No. 292,783, July 3, 1963, now Patent No. 3,399,196, which is a continuation-in-part of application Ser. No. 815,826, May 26, 1959, which is a continuation-in-part of application Ser. No. 775,334, Nov. 21, 1958, which is a continuation-in-part of application Ser. No. 667,042, June 20, 1957, now Patent No. 2,980,677, said application Ser. No. 292,783 being a continuation-in-part of application Ser. No. 815,824, May 26, 1959, now Patent No. 3,187,006, which is a continuation-in-part of application Ser. No. 775,356, Nov. 21, 1958, which in turn is a continuation-in-part of application Ser. No. 637,895, Feb. 4, 1957. This application Apr. 17, 1968, Ser. No. 721,952**
**Claims priority, application Switzerland, Feb. 10, 1956, 29,762/56**
**The portion of the term of the patent subsequent to Aug. 27, 1985, has been disclaimed**
**Int. Cl. C07d *57/16***
**U.S. Cl. 260—256.4F** **2 Claims**

Compound of the formulae



in which $R_1$ stands for branched alkyl, alkenyl or cycloalkyl having at least 3 carbon atoms or hydroxyalkyl, R' stands for free or substituted amino, hydrazino, halogen or free or etherified mercapto, and R'' stands for hydrogen, alkyl or for R' for example: the 1-isopropyl-4-(n-propylamino)-pyrazolo[3,4-d]pyrimidine.

Use: Coronary dilating, diuretic, analgetic or antibacterial agents.

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**3,600,390**

## NOVEL 5-PHENYL IMIDAZOLIDINO[5,1-a]5H-QUINAZOLINES AND PROCESS THEREFOR

**Margaret H. Sherlock, Bloomfield, N.J., assignor to Schering Corporation, Bloomfield, N.J.**

**No Drawing. Filed July 1, 1968, Ser. No. 743,912**
**Int. Cl. C07d *57/12***
**U.S. Cl. 260—256.4** **8 Claims**

This invention relates to certain 5-phenylimidazolidino [5,1-b]5H-quinazolines, the [5,1-a]isomers thereof and to their use as bronchodilating agents.

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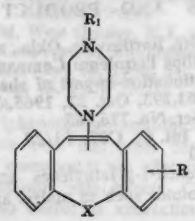
**3,600,391**

## N-[DIBENZO (b,f)AZEPIN-10-YL]-PIPERAZINE COMPOUNDS

**Michele Mastursi, Naples, Sabino Lembo, Pozzuoli, and Rene Viterbo, Naples, Italy, assignors to Richardson-Merrell S.p.A., Naples, Italy**

**No Drawing. Filed Mar. 25, 1968, Ser. No. 715,535**
**Claims priority, application Italy, Mar. 28, 1967, 35,729/67**
**Int. Cl. C07d *51/70***
**U.S. Cl. 260—268** **5 Claims**

New compounds having the following general formula:



in which X is =O, =S, or =N—$R_2$; and R, $R_1$, and $R_2$ are a variety of substituents. The compounds have useful pharmacological activities which include hypertensive, sedative, muscle relaxant, local anesthetic, analgesic, antipyretic, and anti-inflammatory activities. Various salts of these compounds are also useful and are included within the scope of the present invention. Processes of preparing these compounds are described.

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3,600,392

## 1-(9,10 - DIHYDROTHIENO-[3,2-b][1]BENZOTHIEPIN-10-YL)-PIPERAZINE AND HOMOPIPERAZINE DERIVATIVES

**Armin Zust, Birsfelden, Basel-Land, and Walter Schindler, Riehen, Basel-Land, Switzerland, assignors to Geigy Chemical Corporation, Ardsley, N.Y.**

**No Drawing. Filed May 13, 1968, Ser. No. 728,815**

**Claims priority, application Switzerland, May 19, 1967, 7,089/67**

**Int. Cl. C07d** *51/70*

**U.S. Cl. 260—268** **7 Claims**

The compounds are of the class of thiepin derivatives, more particularly benzo thieno thiepin derivatives substituted in 10-position by piperazinyl which may be substituted. The compounds are useful as central depressants, in particular sedatives and tranquilizers. An illustrative embodiment is 1-(9,10-dihydro thieno[3,2-b][1]benzothiepin-10-yl)-4-methyl piperazine.

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3,600,393

## DIALKYLAMINO ALKYLAMINO PYRAZOLO [3,4b] QUINOLINES

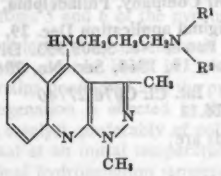
**Rolf Ernst Graeve, Milwaukee, Joseph Robert Pociask, Cudahy, and Robert George Stein, Wauwatosa, Wis., assignors to Aldrich Chemical Company, Inc., Milwaukee, Wis.**

**No Drawing. Filed Mar. 3, 1969, Ser. No. 803,952**

**Int. Cl. C07d** *33/54*

**U.S. Cl. 260—286** **9 Claims**

Compounds of the formula



wherein $R^1$ and $R^2$ each represent (lower)alkyl; and the pharmaceutically acceptable nontoxic salts thereof exhibit hypocholesteremic and hypolipemic activity and are useful as hypocholesteremic and hypolipemic agents for lowering serum cholesterol and phospholipid levels in mammals.

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3,600,394

## 2-AMINOALKYL-3-ARYLISOCARBOSTYRILS

**William E. Coyne and John W. Cusic, Skokie, Ill. assignors to G. D. Searle & Co., Chicago, Ill.**

**No Drawing. Filed May 17, 1968, Ser. No. 729,934**

**Int. Cl. C07d** *35/34*

**U.S. Cl. 260—288** **4 Claims**

3-phenylisocarbostyrils having a dialkylaminoalkyl or similar substituent at the 2-position are described herein. They possess anti-inflammatory, anti-bacterial, anti-protozoal, and anti-algal activity. The compounds are prepared by the reaction of a 3-phenylisocarbostyril with a strong base and an appropriate aminoalkyl halide.

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3,600,395

## 1-PHENYLETHYL-4-AMINOMETHYL-4-PIPERIDINOL COMPOUNDS

**Gilbert Regnier, Chatelay-Malabry, Roger Canevari, Clamart, and Jacques Duhault, Chatou, France, assignors to Societe en nom collectif: Science Union et Cie, Societe Francaise de Recherche Medicale, Suresnes, France**

**No Drawing. Filed May 2, 1969, Ser. No. 821,504**

**Claims priority, application Great Britain, May 21, 1968, 24,176/68**

**Int. Cl. C07d** *29/34*

**U.S. Cl. 260—293.4** **7 Claims**

1 - phenylethyl, or 1-fluorophenylethyl-4-aminomethyl piperidin-4-ols, substituted on the amino by: aliphatic acyl having up to five carbon atmos inclusive, benzoyl, hydroxybenzoyl, chlorobenzoyl, acetoxybenzoyl, methylenedioxybenzoyl, parachlorophenoxyacetyl, nicotinoyl, diethylcarbamoyl or methylsulfonyl.

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3,600,396

## ALPHA-DILOWER ALKYL AMINO - 2,6 - DI-(p-CHLOROPHENYL) - 4-PYRIDINE METHANOLS AND DERIVATIVES THEREOF

**Arthur B. Ash, Detroit, Calvin L. Stevens, Troy, and Anica Markovac, Lathrup Village, Mich., assignors to the United States of America**

**No Drawing. Filed Dec. 17, 1968, Ser. No. 784,467**

**Int. Cl. C07d** *31/42*

**U.S. Cl. 260—296R** **4 Claims**

Antimalarial compounds characterized as alpha-dilower alkylaminomethyl-2,6-di(p-chlorophenyl)-pyridine methanols (VIII) and nontoxic, pharmaceutically acceptable amine acid addition salts are described. These compounds can be prepared by conventional methods. They are preferably prepared by reacting 4-picoline N-oxide with p-chlorophenyl magnesium bromide Grignard reagent to produce 2-p-chlorophenyl-4-picoline (I). (I) was converted to the N-oxide (I)(a) again and reacted with the Grignard reagent again to give 2,6-di-(p-chlorophenyl)-4-picoline (II). Alternatively, (II) may be prepared in one step by adopting a method reported in W. Zecher and F. Krohnke, Chemische Berichte, 94, 698–706 (1961), for the preparation of 2,6-diphenyl-4-picoline, 4,6-diphenyl-2-picoline and 4 - p-nitrophenyl-6-phenyl-2-picoline. This involves reacting a mixture of p-chlorocrotonophenone, p-chlorophenacyl pyridinium bromide, ammonium acetate, glacial acetic acid and acetic anhydride at temperatures up to reflux to effect a ring closure reaction which yields (II) on workup. (II) was oxidized to the corresponding isonicotinic acid which is 2,6-di-(p-chlorophenyl) pyridine-4-carboxylic acid (III) preferably with potassium permanganate. (III) was converted to the corresponding acid chloride (IV) by reaction with thionyl chloride and (IV) was then reacted with diazomethane to produce diazomethyl-2,6-di-(p-chlorophenyl)-4-pyridyl ketone (V). (V) was then reacted with hydrobromic acid to yield alpha-bromomethyl - 2,6-di-(p-chlorophenyl)-4-pyridyl ketone (VI). (VI) was reduced with a hydride such as sodium borohydride to produce bromomethyl - 2,6-di-(p-chlorophenyl)-4-pyridine methanol (VII). (VII) was converted to the antimalarial compounds (VIII) by reaction with a lower alkyl amine in a polar organic solvent. The antimalarial compounds have been shown to be very effective in treating malaria of various types in mammals.

3,600,397

## CERTAIN BENZOTRIAZOLYLPHENOXY TIN COMPOUNDS

Toshio Seki, Osaka-shi, Kozaburo Suzuki, Kobe-shi, and Takashi Matsuzaki, Osaka-shi, Japan, assignors to Nitto Kasei Co., Ltd., Osaka, Japan

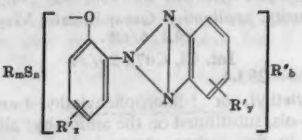
No Drawing. Filed Aug. 25, 1966, Ser. No. 574,924

Claims priority, application Japan, Aug. 25, 1965, 40/51,406

Int. Cl. C07d 55/04

U.S. Cl. 260—299 22 Claims

Compounds of the formula



their preparation and their use as U.V. stabilizers for synthetic resins.

3,600,398

## AMINE DERIVATIVES OF MERCAPTOBENZOTHIAZOLE

Jerry J. Svarz, La Grange, Louis A. Goretta, Naperville, and Wood E. Hunter, Lombard, Ill., assignors to Nalco Chemical Company, Chicago, Ill.

Filed Apr. 18, 1969, Ser. No. 817,337

Int. Cl. C07d 91/44

U.S. Cl. 260—306.6A 1 Claim

A process for producing the thiazole sulfenamides from the group consisting of morpholinobenzothiazole sulfenamide, cyclohexylbenzothiazole sulfenamide and N-tert-butylbenzothiazole sulfenamide.

These sulfenamide derivatives are produced in 94%+ yield and at extremely high purity through a common generalized procedure involving the oxidation of mercaptobenzothiazole in the presence of excess amine and at least 8% by weight of water based on the total reaction mixture with either chlorine, bromine, iodine or an alkali metal hypochlorite.

3,600,399

## CERTAIN 2-AMINO-5-IMIDAZOL-2-YL-1,3,4-THIADIAZOLES

Gerald Berkelhammer, Princeton, and William Henry Gastrock, Hightstown, N.J., William Alan Remers, Suffern, N.Y., and Andrew Stephen Tomcufcik, Old Tappan, and Martin Joseph Weiss, Oradell, N.J., assignors to American Cyanamid Company, Stamford, Conn.

No Drawing. Filed Oct. 11, 1968, Ser. No. 766,987

Int. Cl. C07d 91/62

U.S. Cl. 260—306.8 5 Claims

The preparation of substituted imidazolyl-1,3,4-thiadiazoles by first preparing the imidazole moiety and then constructing the 1,3,4-thiadiazole moiety or by first preparing the 1,3,4-thiadiazole half and then adding the imidazole moiety, are described. A number of these compounds are useful as depressant agents for the treatment of mental disease and also as intermediates in the preparation of 2-amino-5-(1-methyl-5-nitro-2-imidazolyl)-1,3,4-thiadiazole. The latter compound has high antibacterial and antiprotozoal activity.

3,600,400

## 2-OXO-2:3:4:5-TETRAHYDRO-1:4-METHANO-1H-3-BENZAZEPINES

Karl Schenker, Binningen, Switzerland, assignor to Ciba Corporation, New York, N.Y.

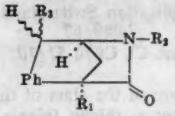
No Drawing. Application Feb. 21, 1968, Ser. No. 707,306, now Patent No. 3,474,463, which is a continuation-in-part of application Ser. No. 457,858, May 21, 1965, now Patent No. 3,396,171. Divided and this application May 1, 1969, Ser. No. 821,140

Claims priority, application Switzerland, June 10, 1964, 7,584/64; Apr. 28, 1965, 5,888/65; Apr. 6, 1967, 4,966/67

Int. Cl. C07d 27/30

U.S. Cl. 260—326.5 10 Claims

Compounds of the formula



in which

Ph is an optionally substituted ortho-phenylene radical;

$R_1$ is hydrogen or an optionally substituted hydrocarbon radical;

$R_2$ is hydrogen or an optionally substituted hydrocarbon radical;

$R_3$ is hydrogen or a halogen atom;

e.g. the 1-phenyl-2-oxo-2:3:4:5-tetrahydro-1:4-methano-1H-3-benzazepine.

Use: Starting materials for the preparation of diuretic or analgetic agents.

3,600,401

## DIKETO-BENZO-DIPYROLE POLYMERS

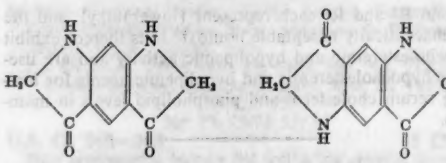
Charles L. Thomas, Swarthmore, Pa., assignor to Sun Oil Company, Philadelphia, Pa.

No Drawing. Original application Dec. 29, 1966, Ser. No. 605,574, now Patent No. 3,505,353. Divided and this application Nov. 19, 1968, Ser. No. 796,254

Int. Cl. C07d 27/40

U.S. Cl. 260—326.11 5 Claims

The compounds are:



2,6-dihydro-3,5-diketobenzo (1,2-b:5,4-b') dipyrrole and 2,6-dihydro-3,7-diketo-benzo(1,2-b:4,5-b') dipyrrole

and the polymers prepared therefrom by oxidative polymerization of the individual monomers or mixtures of the two monomers. The monomers are useful as insecticides and biocides, and the polymers are useful as dyes and semiconductors.

3,600,402

## METHOD OF ISOLATING GIBBERELLINS FROM CULTURE FLUID OBTAINED BY CULTIVATING A MICROORGANISM

**Raisa Leonidovna Krutova, Ul. Krasina 86, kv. 15, Kurgan, U.S.S.R.; Georgy Sergeevich Muromtsev, 1 ul. Oktyabrskogo polya 21, kv. 175, Moscow, U.S.S.R.; and Eleonora Nikolaevna Pervy, Poltavskaya, ul. 9, kv. 47; and Jury Sergeevich Rakovsky, Ul. Kirova 147, kv. 75, both of Kurgan, U.S.S.R.**

**No Drawing. Filed Oct. 24, 1968, Ser. No. 770,389**

**Int. Cl. C07d** *5/32*

**U.S. Cl. 260—343.3** **5 Claims**

A method of isolating gibberellins from culture fluid obtained by cultivating an organism, e.g., the fungus *Fusarium moniliforme* Sheld., which comprises precipitation of gibberellins with iron salts at a pH of 2.5–4.5 with subsequent separation of the precipitate and drying.

3,600,403

## HYDROGENATION OF PYRONE COMPOUNDS

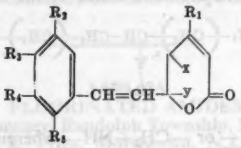
**Hans Brinkhoff, Munich, Germany, assignor to Spezialchemie Gesellschaft mit beschrankter Haftung und Co., Arzneimittelfabrik, Munich, Germany**

**No Drawing. Filed Nov. 24, 1967, Ser. No. 685,340**

**Int. Cl. C07d** *7/10*

**U.S. Cl. 260—343.5** **6 Claims**

An improved process of catalytically hydrogenating pyrone compounds being connected by an unsaturated aliphatic bridge with a nuclear substituent and especially a pyrone compound of the following formula



wherein

$R_1$ is lower alkoxy with 1 to 5 carbon atoms;

$R_2$, $R_3$, $R_4$, and $R_5$ are members selected from the group consisting of hydrogen, lower alkoxy with 1 to 5 carbon atoms, and $R_3$ and $R_4$ form the methylene dioxy group —O—$CH_2$—O— while $R_2$ and $R_5$ are hydrogen; and

$x$ and $y$ are members selected from the group consisting of hydrogen and $x$ and $y$ form the double bond between the carbon atoms 5 and 6 of the pyrone ring,

whereby the double bond in the aliphatic bridge is hydrogenated while the double bond in 3,4-position of the pyrone ring remains unaffected and the pyrone ring is not split up. Hydrogenation is effected in the presence of a platinum metal catalyst, preferably of colloidal palladium according to Paal at an initial temperature of −5° C. to −10° C. The final hydrogenation temperature should not exceed +15° C. The yield is almost quantitative.

Examples of pyrone compounds to be hydrogenated are methysticin and kawain yielding dihydromethysticin and dihydrokawain.

3,600,404

## TETRAHYDROPYRANYL ETHERS

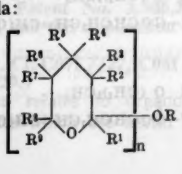
**Jerome H. Ludwig, Cincinnati, Ohio, assignor to Emery Industries, Inc., Cincinnati, Ohio**

**No Drawing. Filed Jan. 4, 1968, Ser. No. 695,566**

**Int. Cl. C07d** *7/04*

**U.S. Cl. 260—345.9** **1 Claim**

Novel tetrahydropyranyl ethers, esters or etheresters having the formula:



wherein $n$ represents a whole number from 1 to about 3 inclusive,

wherein OR represents a residue of aliphatic carboxylic acids having from about 7 to about 32 carbon atoms, alkenecarboxylic acids having from about 7 to about 32 carbon atoms, polymerized fatty acids having about 36 carbon atoms, polymerized fatty acids having about 54 carbon atoms, di(hydroxyaryl) alkylenecarboxylic acids, alkarylhydroxy or alkylene di(hydroxyaryl); and wherein $R^1$ to $R^9$ inclusive is either hydrogen or lower alkyl.

These novel compounds are useful as stabilizers in vinyl halide resin compositions containing, for example, polyvinyl chloride or polyvinyl chloride-acetate copolymers. The tetrahydropyranyl ethers and/or esters according to the above formula are further characterized by unexpected properties or stabilizing activities.

3,600,405

## PREPARATION OF FURAN BY OXIDATION OF SPECIFIED ORGANIC COMPOUNDS

**Alfio J. Besozzi, Houston, Tex., assignor to Petro-Tex Chemical Corporation, Houston, Tex.**

**No Drawing. Filed Dec. 30, 1968, Ser. No. 788,034**

**Int. Cl. C07d** *5/14*

**U.S. Cl. 260—346.1** **4 Claims**

Process for the production of furan by contacting specified oxygenated organic compounds with a catalyst containing Mo and Bi atoms in the presence of oxygen and an inert diluent, under particular conditions of temperature and pressure. The reaction of crotonaldehyde to furan is preferred.

3,600,406

## TETRACARBOXYLIC CYCLOALKYL KETONES

**Irving Touval, Fords, N.J., assignor to Universal Oil Products Company, Des Plaines, Ill.**

**No Drawing. Continuation-in-part of application Ser. No. 572,915, Aug. 17, 1966. This application Feb. 14, 1969, Ser. No. 799,494**

**Int. Cl. C07c** *61/06, 61/08, 61/10*

**U.S. Cl. 260—346.3** **8 Claims**

Bis(cycloalkyldicarboxylic acid)ketones, the corresponding anhydrides and lower alkyl esters thereof are exemplified by bis(4 - cyclohexyl - 1,2-dicarboxylic acid) ketone. The compounds may be prepared by reacting a cycloalkene dicarboxylic compound with carbon monoxide in the presence of a metal carbonyl and water under hydroxylation conditions, said compounds being useful as reactive components of polyesters, epoxy curing agents, etc.

3,600,407

## FURFURYL-2-METHOXY-3,6-DICHLOROBENZOATE

**Alfred A. Levin, Skokie, and Sidney B. Richter, Chicago, Ill., assignors to Velsicol Chemical Corporation, Chicago, Ill.**

**No Drawing. Filed Apr. 4, 1969, Ser. No. 813,723**

**Int. Cl. C07d** *5/00*

**U.S. Cl. 260—347.4** **1 Claim**

This invention discloses the new compound furfuryl 2-methoxy-3,6-dichlorobenzoate and further discloses a method of controlling weeds with a herbicidal composition which comprises as the essential active ingredient the above compound.

3,600,408

## LIQUID PRESERVATIVE COMPOSITION WHICH CONTAINS PENTACHLOROPHENOL

Kenneth F. Bursack and Millard L. Oldham, Wichita, Kans., assignors to Frontier Chemical Company, Division of Vulcan Materials Company, Wichita, Kans.

No Drawing. Filed June 21, 1965, Ser. No. 465,742
Int. Cl. A01n *9/26*
U.S. Cl. 424—347 14 Claims

The sludging tendency of solutions of pentachlorophenol in a liquid organic solvent, such as an alkylene glycol compound or a hydrocarbon solvent or a mixture of such or similar solvents, is reduced by the addition of an aliphatic carboxylic, an alkyl sulfuric or an alkyl sulfonic acid which contains at least five carbon atoms per molecule.

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3,600,409

## PROCESS FOR SYNTHESIZING HEXAFLUOROPROPYLENE EPOXIDE

Alwin S. Milian, Jr., and Paul R. Resnick, Wilmington, Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Filed Apr. 9, 1968, Ser. No. 719,851
Int. Cl. C07d *1/08*
U.S. Cl. 260—348.5 4 Claims

In the oxidation of hexafluoropropylene to hexafluoropropylene epoxide, hexafluoroacetone is also formed, which formation can be substantially eliminated by addition of a small amount of neutral inert aromatic compound to the reaction zone.

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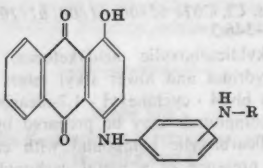
3,600,410

## 1-HYDROXY-4-SULFONAMIDOANILINOANTHRAQUINONE DISPERSE DYES

Carl Johannes Berninger and Joseph William Fitzpatrick, Toms River, N.J., assignors to Toms River Chemical Corporation, Toms River, N.J.

No Drawing. Filed Apr. 10, 1968, Ser. No. 720,349
Int. Cl. C09b *1/50, 1/52*
U.S. Cl. 260—373 5 Claims

1-hydroxy - 4 - sulfonamidoanilinoanthraquinone and 1-hydroxy - 4 - carboxamidoanilinoanthraquinone compounds of the general formula



in which R is a sulfonyl or benzoyl radical such as an alkylsulfonyl radical of 1 to 16 carbon atoms, a branched alkylsulfonyl radical of 3 to 5 carbon atoms, a benzenesulfonyl radical, both unsubstituted and substituted, or an unsubstituted or substituted benzoyl radical are valuable dyestuffs for the coloration of aromatic polyester fibers.

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3,600,411

## REDOX POLYESTER POLYMERS

Harold G. Cassidy, Gerhard Wegner, and Nobuo Nakabayashi, New Haven, Conn., assignors to Research Corporation, New York, N.Y.

No Drawing. Filed Oct. 7, 1968, Ser. No. 765,612
Int. Cl. C07c *49/64;* C08g *17/08, 33/10*
U.S. Cl. 260—396 4 Claims

Novel redox polymers useful as antioxidants are prepared by the direct condensation of a quinone-diol with a diacyl chloride, phosgene or a diisocyanate.

3,600,412

## 6,1'-SPIROCYCLOPROPYL COMPOUNDS OF THE ANDROSTANE SERIES

Norman A. Nelson, Galesburg, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

No Drawing. Filed Mar. 24, 1965, Ser. No. 442,525
Int. Cl. C07c *169/22*
U.S. Cl. 260—397.4 17 Claims

Compounds of the class of 6,1'-spirocyclopropyl androstanes and androstenes useful as anabolic, androgenic, estrogenic, hypocholesteremic, antifertility and progestational agents and processes for their production.

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3,600,413

## N-ALKYLATION OF AROMATIC AMINES

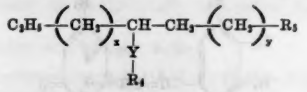
Robert A. Grimm, Lakeville, Minn., assignor to Ashland Oil & Refining Company, Houston, Tex.

No Drawing. Filed May 16, 1968, Ser. No. 729,563
Int. Cl. C09f *7/00;* C07c *121/52, 101/78, 87/28, 29/02*
U.S. Cl. 260—404 8 Claims

A method for producing N-alkylated aromatic amines comprising coreacting carbon monoxide, hydrogen, an aromatic amine, and an olefinic compound at pressures above 200 p.s.i. in the presence of a catalyst which is the reaction product of:

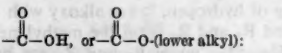
(A) a salt selected from the group consisting of rhodium halides, ruthenium halides, and cobalt carbonyls, with
(B) a complexing agent selected from the group consisting of trihydrocarbyl phosphine, trihydrocarbyl arsine, and trihydrocarbyl stibine.

An N-alkylated aromatic amine of the formula:



wherein:

Y is —CH=N— or —$CH_2$—NH— wherein the nitrogen atom is directly bonded to $R^4$;
$R^4$ is an aromatic radical;
$R^5$ is —H, —$CH_3$, —CH, —OH, —CHO, —$NH_2$



$x$ is an integer from 0 to 23 inclusive;
$y$ is an integer from 0 to 23 inclusive; and
$x+y$ is 0 to 23.

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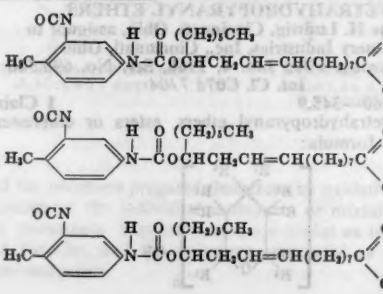
3,600,414

## SILOXANES HAVING CASTOR OIL DERIVATIVES JOINED THERETO THROUGH URETHANE RADICALS

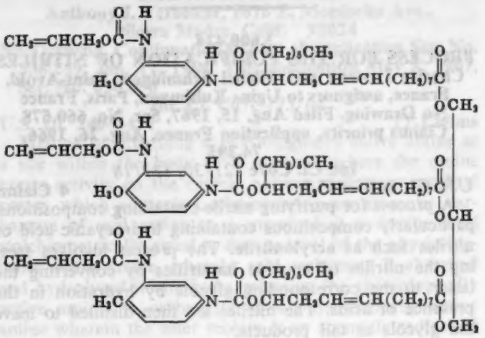
Robert S. Craig, Waukegan, Ill., assignor to General Electric Company

No Drawing. Filed Dec. 1, 1967, Ser. No. 687,093
Int. Cl. C09f *7/00*
U.S. Cl. 260—404.5 8 Claims

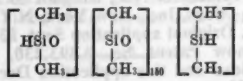
A radical derived from castor oil is joined to a siloxane through a urethane radical. A compound within the scope of the present invention is made by reacting a triisocyanate-terminated triurethane derivative of glyceryltriricinoleate of the formula:



with allyl alcohol to produce a castor oil derivative of the formula:



This terminal olefin-containing derivative is then reacted with a polysiloxane of the formula:



to produce a copolymer having alternate siloxane and castor oil derivative units. Products within the scope of the present invention are useful in auto polishes.

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3,600,415

## FLUORINATED AMIDES

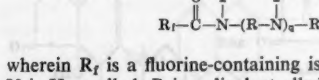
**Richard F. Sweeney, Randolph Township, Morris County, and Alson K. Price, Morristown, N.J., assignors to Allied Chemical Corporation, New York, N.Y.**

**No Drawing. Filed Aug. 1, 1968, Ser. No. 749,302**

**Int. Cl. C07d *103/38***

**U.S. Cl. 260—404.5** **18 Claims**

Fluorinated amides useful as oil-repellency agents have the structural formula



wherein $R_f$ is a fluorine-containing isoalkoxyalkyl group; Y is H or alkyl; R is a divalent alkylene bridging group; $q$ is an integer from 0 to 2; Q is a radical containing a tertiary amino group; and Y′ is hydrogen, alkyl, hydroxyalkyl, an acyl radical $R_fCO$— wherein $R_f$ is as described above, or a radical of the formula —RNYZ wherein R and Y are as described above and Z is hydrogen, alkyl, or the above-described acyl radical.

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3,600,416

## ORGANOTIN (PHENYLOXYCARBONYL) PHENOLATES

**Toshio Seki, 104 Higashimikuni-cho 2-chome Higashiyodogawa-ku, Osaka-shi, Japan; Kozaburo Suzuki, 452 Motoyama-cho Mori Higashinada-ku, Kobe-shi, Japan; and Takashi Matsuzaki, 30 Furuichikita-dori 5-chome Joto-ku, Osaka-shi, Japan**

**No Drawing. Original application Sept. 9, 1966, Ser. No. 578,140, now Patent No. 3,505,383, dated Apr. 7, 1970. Divided and this application June 24, 1969, Ser. No. 871,017**

**Int. Cl. C07f *7/22*; C08f *45/62***

**U.S. Cl. 260—429.7** **7 Claims**

This invention relates to organotin (phenyloxycarbonyl) phenolates which are useful for stabilizing synthetic resins against the degrading effect of ultraviolet light.

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3,600,417

## METHOD OF REMOVING SECONDARY ALUMINUM ALKOXIDES FROM PRIMARY ALUMINUM ALKOXIDES

**Allan J. Lundeen and James E. Yates, Ponca City, Okla., assignors to Continental Oil Company, Ponca City, Okla.**

**Filed Oct. 21, 1968, Ser. No. 769,348**

**Int. Cl. C07f *5/06***

**U.S. Cl. 260—448AD** **6 Claims**

A method for removing secondary aluminum alkoxides from primary aluminum alkoxides by heating a mixture containing both types of compounds to selectively convert the secondary alkoxides to olefinic compounds without substantial molecular change of the primary alkoxide. The method is further developed to either remove from the mixture, the olefinic products of thermal decomposition of the secondary alkoxides, or, where such products are derived from dialuminum alkoxides containing both primary and secondary substitution of the alkyl group, to hydrolyze them to primary alcohols. In either procedure, the starting mixture is improved as a source material of alcohol sulfates useful as detergents.

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3,600,418

## ORGANO-SILICONE BLOCK COPOLYMERS

**Donald L. Bailey, Sistersville, W. Va., and Francis M. O'Connor, Akron, Ohio, assignors to Union Carbide Corporation, New York, N.Y.**

**No Drawing. Continuation-in-part of application Ser. No. 162,980, Dec. 21, 1961, now Patent No. 3,480,583, which is a continuation-in-part of applications Ser. No. 660,997, and Ser. No. 661,009, both May 23, 1957. Said application Ser. No. 660,997 being a continuation-in-part of application Ser. No. 417,935, Mar. 22, 1954, now Patent No. 2,834,748, and said application Ser. No. 661,009 being in turn a continuation-in-part of application Ser. No. 435,938, July 10, 1954, now Patent No. 2,917,480. This application Aug. 5, 1969, Ser. No. 847,716**

**Int. Cl. C07f *7/04, 7/18***

**U.S. Cl. 260—448.8R** **24 Claims**

This invention relates to block copolymer compositions comprising at least one siloxane block and at least one oxyalkylene block, (I) the siloxane block (a) being a siloxane polymer composed of difunctional silicon atoms or both difunctional silicon atoms and at least one trifunctional silicon atom (each difunctional silicon atom being linked to two monovalent hydrocarbon groups and two oxygen atoms and each trifunctional silicon atom being linked to a hydrocarbon group and three oxygen atoms) that are joined through silicon-oxygen-silicon bonds and (b) being linked at one end to the oxyalkylene block by a carbon-oxygen-silicon bond and at the other end to a member selected from the group consisting of (1) another of said oxyalkylene blocks by a carbon-oxygen-silicon bond, (2) a trihydrocarbonsiloxy group and (3) an alkoxy group; and (II) the oxyalkylene block (a) being an oxyalkylene polymer having at least five oxyalkylene units joined together by carbon-oxygen-carbon bonds and (b) being bonded at one end to said siloxane polymer through a carbon-oxygen-silicon bond and at the other end to either (1) another of said siloxane blocks by a carbon-oxygen silicon bond or (2) a hydroxyl group, provided at least one oxyalkylene block is bonded at one end to a hydroxyl group.

The block copolymers of this invention are useful as lubricants for metals, fibrous glass, rubber molds and textiles, hydraulic fluids, emulsifying agents, surface tension depressants and foam stabilizers for polyurethane foam.

3,600,419

## PREPARATION OF AROMATIC ISOCYANATES

Nicholas B. Franco, North Haven, and Martin A. Robinson, Orange, Conn., assignors to Olin Corporation

No Drawing. Filed Sept. 3, 1968, Ser. No. 757,109
Int. Cl. C07c *119/04*
U.S. Cl. 260—453P 13 Claims

The process for preparing an organic isocyanate by reacting an organic nitro compound with carbon monoxide in the presence of a catalyst system comprised of either a mixture or a complex of nickel iodide and a Lewis base. The Lewis base is preferably a heteroaromatic nitrogen-containing compound containing between five and six members in the ring, containing no element other than nitrogen and carbon in the ring, containing no more than two nitrogen atoms in the ring, and having at least two double bonds in the ring, such as pyridine and isoquinoline. The catalyst system may also include a second component such as molybdenum trioxide or another metal oxide.

3,600,420

## PREPARATION OF PIMELIC ACID DERIVATIVES

George E. Illingworth, Mount Prospect, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

No Drawing. Filed Mar. 29, 1968, Ser. No. 717,436
Int. Cl. C07c *55/16, 69/46, 153/07*
U.S. Cl. 260—455C 11 Claims

Pimelic acid derivatives are prepared by condensing allene with a carboxylic acid or a derivative thereof in the presence of a free radical initiator.

3,600,421

## POLYHALOFORMATES

Thomas K. Brotherton, John W. Lynn, and John Smith, Jr., Charleston, W. Va., assignors to Union Carbide Corporation

No Drawing. Filed June 26, 1967, Ser. No. 648,963
Int. Cl. C07c *69/00*
U.S. Cl. 260—463 7 Claims

Alkylene oxides and/or epsilon-caprolactone are reacted with nucleus polyol compounds comprising sorbitol 1,2,6-hexanetriol, trimethylolpropane, trimethylolethane 1,1,5,5-tetrakis(4 - hydroxyphenyl)pentane, pentaerythritol and pyrogallol in a ratio of about 1 to 100 moles per mole of the nucleus polyol to form a poly-hydroxy compound.

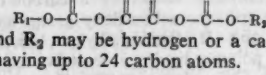
3,600,422

## CARBONATE-GROUP-CONTAINING OXALIC ACID ANHYDRIDE

Robert K. Krueger, Oconomowoc, and Saul S. Weinstein, Milwaukee, Wis., assignors to Jos. Schlitz Brewing Company, Milwaukee, Wis.

Filed Nov. 25, 1966, Ser. No. 597,155
Int. Cl. C07c *69/100*
U.S. Cl. 260—463 2 Claims

A mixed anhydride having particular use for eliminating the growth and reproduction of microorganisms and having the following formula:



where $R_1$ and $R_2$ may be hydrogen or a carbon containing radical having up to 24 carbon atoms.

3,600,423

## PREPARATION OF HYDROXY-CAPRONITRILE

Gerardus I. J. Dreessen, Geleen, Netherlands, assignor to Stamicarbon N.V., Heerlen, Netherlands

No Drawing. Filed June 20, 1969, Ser. No. 835,220
Claims priority, application Netherlands, June 21, 1968, 6808725
Int. Cl. C07c *121/02*
U.S. Cl. 260—465.2 1 Claim

Preparation of hydroxy-capronitrile by reaction in the vapour phase of ε-caprolactone with ammonia, the reaction temperature being maintained at 270–325° C. and zinc oxide being used as a catalyst.

3,600,424

## PROCESS FOR THE PURIFICATION OF NITRILES

Charles Laviron and Michel Schmidgen, Saint-Avold, France, assignors to Ugine Kuhlmann, Paris, France

No Drawing. Filed Aug. 15, 1967, Ser. No. 660,578
Claims priority, application France, Aug. 26, 1966, 74,295
Int. Cl. C07c *121/30, 121/18*
U.S. Cl. 260—465.3 4 Claims

A process for purifying nitrile-containing compositions, particularly compositions containing hydrocyanic acid or nitriles such as acrylonitrile. The process involves freeing the nitriles of epoxide impurities by converting the latter to the corresponding glycols by hydration in the presence of acids. The nitriles are then distilled to leave the glycols as tail products.

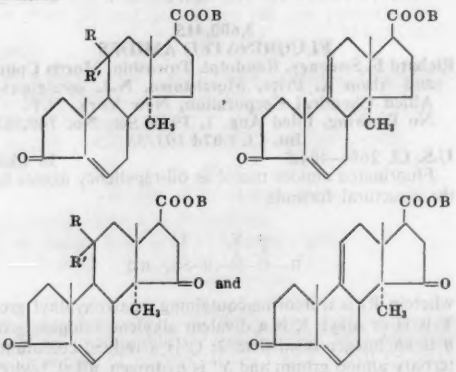
3,600,425

## SYNTHESIS OF STEROIDS

Josef Fried, Princeton, N.J., assignor to E. R. Squibb & Sons, Inc., New York, N.Y.

No Drawing. Original application Sept. 13, 1963, Ser. No. 308,693, now Patent No. 3,393,230, dated July 16, 1968. Divided and this application Dec. 13, 1967, Ser. No. 725,962
The portion of the term of the patent subsequent to Feb. 23, 1982, has been disclaimed
Int. Cl. C07c *171/06*
U.S. Cl. 260—468F 4 Claims

This invention relates to novel compounds having the formulae




wherein B is selected from the group consisting of hydrogen and lower alkyl; R is hydrogen; $R^1$ is hydroxy; and together R and $R^1$ is oxo(O=). These compounds are intermediates for steroids possessing anti-androgenic activity.

3,600,426

## 1-AMINOCYCLOPENTANECARBOXYLIC ACID ESTERS

Norman H. Grant, Wynnewood, and Harvey E. Alburn, West Chester, Pa., assignors to American Home Products Corporation, New York, N.Y.

No Drawing. Filed Sept. 30, 1968, Ser. No. 763,947
Int. Cl. C07c *101/36, 125/06, 101/44*
U.S. Cl. 260—368R 4 Claims

1-aminocyclopentanecarboxylic acid esters optionally mono-substituted on the amino group with alkyl, aryl, arylalkyl or arylalkoxycarbonyl (I) are provided by reacting the corresponding 1-aminocyclopentylacyl compound (II) with a reagent (III) capable of providing the ester linkage. Compounds (I) are pharmacologically active in warm blooded lower animals as anti-inflammatory and anti-immune agents.

3,600,427

## PHENYL CARBAMATE LATENTIATED PHENETHYLAMINES

Anthony J. Verbiscar, 1616 E. Montecito Ave., Sierra Madre, Calif. 91024

No Drawing. Continuation-in-part of application Ser. No. 338,289, Jan. 17, 1964. This application May 8, 1967, Ser. No. 636,650

Int. Cl. C07c *125/04*

U.S. Cl. 260—471 17 Claims

Method of providing a physiologically active amine at a site within the body of a mammal where the amine exerts activity on the central nervous system or cerebral cortex which comprises administering an aromatic carbamate of said amine to a mammal at a dosage level stoichiometrically equal to dosage level of the physioliogically active amine, whereby said carbamate is absorbed and hydrolyzed in the body, releasing the physiologically active amine. A carbamate of a physiologically active amine wherein the ester moiety is an aromatic radical of the benzene and pyridine series which may be substituted with carbalkoxy, cyano, nitro, carbamoyl, sulfamoyl, acyl and halogen radicals and wherein the nitrogen atom of the carbamic acid moiety is a nitrogen atom of a non-tertiary amino radical of the physiologically active amine penetrates the blood-brain barrier and then release the amine.

3,600,428

## 1-PHENYL-2-ACYLOXY-6-METHOXY-3-4-DIHYDRONAPHTHALENES

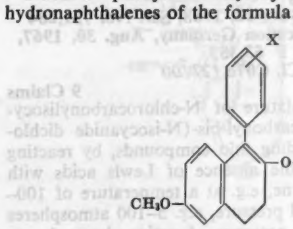
Daniel Lednicer, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

No Drawing. Original application Aug. 17, 1966, Ser. No. 572,889, now Patent No. 3,452,102, dated June 24, 1969. Divided and this application Jan. 14, 1969, Ser. No. 791,148

Int. Cl. C07c *69/76, 69/78*

U.S. Cl. 260—476C 2 Claims

Novel 1 - phenyl - 2 - acyloxy - 6 - methoxy - 3,4 - dihydronaphthalenes of the formula:




wherein X is hydrogen, halogen, trifluoromethyl or loweralkyl and $R_2$ is an aryl radical of 6 to 10 carbon atoms, inclusive. These compounds are useful intermediates in the preparation of the corresponding 1,2-diphenyl-6-methoxy - 1,2,3,4 - tetrahydro-1,2-naphthalenediols.

3,600,429

## PRODUCTION OF ORGANIC ESTERS IN THE PRESENCE OF PALLADIUM ON AN ALUMINA SUPPORT IN SPINEL FORM

Walter Kronig, Leverkusen, Germany, and Bruno Georg Gustav Frenz, deceased, late of Leverkusen, Germany, by Waltraud Evelin Ursula Frenz, acting legal representative, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

No Drawing. Continuation-in-part of applications Ser. No. 370,360, May 26, 1964, Ser. No. 472,734, July 16, 1965, Ser. No. 506,263 and Ser. No. 506,282, both Nov. 3, 1965. This application Dec. 19, 1966, Ser. No. 603,710

Int. Cl. C07c *67/04*

U.S. Cl. 260—475N 4 Claims

An improved process for preparing organic acetates and esters by reacting an organic acid, oxygen and an unsaturated compound in the presence of a novel catalyst comprising palladium supported on a spinel containing carrier.

3,600,430

## PURIFICATION OF DIESTERS OF BENZENE DICARBOXYLIC ACIDS

Preston K. Martin and Bobby J. Bland, Corpus Christi, Tex., assignors to Celanese Corporation, New York, N.Y.

No Drawing. Filed Mar. 22, 1968, Ser. No. 715,202

Int. Cl. C07c *69/80, 69/82*

U.S. Cl. 260—475PR 12 Claims

A process for the purification of a diester of a benzene dicarboxylic acid, e.g. bis(2-hydroxyethyl) terephthalate, by mixing a mononuclear aromatic hydrocarbon or a halohydrocarbon solvent with an insoluble amount of molten diester, followed by separating the resulting two phases and recovering purified diester from the lighter of the two phases.

3,600,431

## NEOALKANOIC ACID ESTERS OF PHENOLS

Wallace Edmondson Taylor and Enrique Roberto Witt, Corpus Christi, Tex., assignors to Celanese Corporation, New York, N.Y.

No Drawing. Application Oct. 22, 1964, Ser. No. 405,821, now Patent No. 3,462,468, dated Aug. 19, 1969, which is a continuation-in-part of application Ser. No. 174,378, Feb. 20, 1962. Divided and this application Dec. 20, 1968, Ser. No. 816,430

Int. Cl. C07c *69/24, 69/28, 69/78*

U.S. Cl. 260—479R 10 Claims

This invention relates to neoalkanoic acid esters of aromatic hydroxy compounds which are useful as lubricants suited for use at high temperatures.

3,600,432

## PREPARATION OF BUTYLIDENE MALONIC ACID ESTERS

Christoph Zinsstag and Gerhard Schreiner, Visp, Switzerland, assignors to Lonza Ltd., Gampel, Valais, Switzerland

No Drawing. Filed Mar. 4, 1968, Ser. No. 709,939

Claims priority, application Switzerland, Mar. 7, 1967, 3,274/67

Int. Cl. C07c *69/38*

U.S. Cl. 260—485R 10 Claims

Butylidene malonic acid esters of the formula

$$CH_3—CH_2—CH_2—CH=C(COOR)_2$$

are prepared by adding an excess of at least 50 mole percent, calculated on malonic ester, of n-butyraldehyde, to a charge containing malonic ester, piperidine, a strong organic acid, and an entraining agent, at a pressure of 1.5 to 4 atm. and a temperature of 80 to 130° C. whereby the water formed is removed during the reaction by the entraining agent.

3,600,433

## PERFLUORO CYCLOHEXANE ESTERS OF ACRYLIC AND METHACRYLIC ACIDS

Dewey G. Holland, Allentown, Ronald C. Moyer, Souderton, John H. Polevy, Allentown, and Robert A. Walde, Emmaus, Pa., assignors to Air Products and Chemicals, Inc., Philadelphia, Pa.

No Drawing. Filed Jan. 11, 1967, Ser. No. 608,510

Int. Cl. C07c *69/54*

U.S. Cl. 260—486R 6 Claims

$C_2$ and higher alkyl benzoyl halides are subjected to electrolytic fluorination in a fluorination cell under conditions producing corresponding perfluorinated (alkyl cyclohexane) carbonyl fluorides in high yield and with minimum destruction of the carbonyl function. Periodic reversal of polarity, circulation of HF electrolyte, and pro-

longed uniform production rate subsequent to an induction period of several days are described as contributing factors. Perfluoro and polyfluoro cyclohexane carbonyl fluorides, particularly those containing a 4 perfluoroalkyl substituent, are converted to amides or esters having polymerizable unsaturation. Segmented copolymers such as polybutadiene-poly (perfluoro-4-n butyl cyclohexane) carbinol acrylate impart soil repellancy and related perfluoro surface properties to substrates such as textiles. Fabrics treated with such copolymers and thermally cured, and containing as little as 0.5% fluorine, have acceptable oil and water repellency.

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3,600,434

## HALIDE ADDITION PROCESS

Frederick F. Rust, Orinda, and Harvey S. Klein, Berkeley, Calif., assignors to Shell Oil Company, New York, N.Y.

No Drawing. Original application Feb. 6, 1964, Ser. No. 343,136, now Patent No. 3,480,661, dated Nov. 25, 1969. Divided and this application May 29, 1969, Ser. No. 840,085

Int. Cl. C07c *67/00, 51/00, 45/00*

U.S. Cl. 260—486H 10 Claims

Halogenated carbonylic compounds are prepared by the addition of α-(di- to polyhalo) carbonylic compounds to olefins and dienes in the presence of a copper salt as catalyst.

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3,600,435

## BIS ALIPHATIC PHOSPHONIC ACID ANHYDRIDES

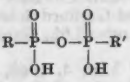
David I. Randall and Clarence R. Stahl, Easton, Pa., assignors to GAF Corporation, New York, N.Y.

No Drawing. Filed Jan. 26, 1968, Ser. No. 700,743

Int. Cl. C07f *9/28, 9/38*

U.S. Cl. 260—502.4P 1 Claim

Bis aliphatic phosphonic acid anhydrides represented by the formula:



wherein R and R' represent an alkyl group, including halo alkyl groups, of 1 to 6 carbon atoms, and preferably a 2-haloalkyl group.

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3,600,436

## (3-OXOPENTA-1,4-DIEN-1,5-YLENE)-BIS-[(p-PHENYLENEOXY)ACETIC ACID]

Stephen J. Kuhn and Janet E. Ilavsky, Sarnia, Ontario, Canada, assignors to The Dow Chemical Company, Midland, Mich.

No Drawing. Filed May 22, 1968, Ser. No. 731,293

Int. Cl. C07c *65/00*

U.S. Cl. 260—520 1 Claim

Disclosed is (3-oxopenta-1,4-dien-1,5-ylene) - bis - [(p-phenyleneoxy)acetic acid] which compound is a useful insecticide.

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3,600,437

## SUBSTITUTED PHENYLALKANOIC ACIDS AND DERIVATIVES THEREOF

Winston S. Marshall, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

No Drawing. Continuation-in-part of applications Ser. No. 752,801, Aug. 15, 1968, and Ser. No. 823,477, May 9, 1969. This application May 28, 1969, Ser. No. 828,756

Int. Cl. C07c *65/00, 149/40*

U.S. Cl. 260—520 6 Claims

Novel alkanoic acids, substituted by 3-phenoxyphenyl or 3-phenylthiophenyl groups, and the esters, amides, amines, alcohols, ethers, tetrazoles, carbamates, and ureas related thereto as well as novel intermediates useful in the preparation of such compounds. The compounds of this invention are useful as antiinflammatory, analgesic, and antipyretic agents.

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3,600,438

## NITROSO DIFLUORO ACETYL HALIDES AND A METHOD FOR THE PREPARATION THEREOF

Robert A. Falk, Rockaway, N.J., assignor to Thiokol Chemical Corporation, Bristol, Pa.

No Drawing. Filed Nov. 29, 1968, Ser. No. 780,198

Int. Cl. C07c *51/58, 53/20*

U.S. Cl. 260—544 4 Claims

Compounds represented by the formula

$$ONCF_2COX$$

wherein X is fluoro, chloro, or bromo are disclosed. A method for producing these compounds is provided which consists of reacting for example a 1,1,2,2-tetrafluoro-2-nitroso ethyl or lower alkyl ether with $AlCl_3$ in an anhydrous solvent at a temperature from −10° C. to 50° C. and recovering nitroso difluoro acetyl chloride and nitroso difluoro acetyl fluoride. The compounds are useful crosslinking monomers for making polymers which are highly resistant to oxidation and corrosion.

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3,600,439

## PROCESS FOR THE PREPARATION OF A MIXTURE OF N - CHLOROCARBONYL-ISOCYANIDE DICHLORIDE AND CARBONYL-BIS - (N-ISOCYANIDE DICHLORIDE)

Hermann Hagemann, Cologne-Flittard, Germany, assignor to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

No Drawing. Filed May 22, 1968, Ser. No. 731,284

Claims priority, application Germany, Aug. 30, 1967, F 53,353

Int. Cl. C07c *127/00*

U.S. Cl. 260—544 9 Claims

Preparation of a mixture of N-chlorocarbonylisocyanide dichloride and carbonyl-bis-(N-isocyanide dichloride) or the corresponding thio compounds, by reacting cyanogen chloride in the absence of Lewis acids with phosgene or thiophosgene, e.g. at a temperature of 100–300° C., under elevated pressure, e.g. 5–100 atmospheres excess pressure, in the presence of active charcoal, optionally in the presence of an inert gas and/or inert solvent, the mixture being recovered by distillation; each of the mixture components being usable directly as insecticides as well as in the production of auxiliary components for use in the manufacture of synthetic resins and of plant protective agents.

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3,600,440

## PROCESS FOR CARRYING OUT PARTIAL OXIDATION OF ORGANIC COMPOUNDS

E. Gordon Foster, Bronxville, N.Y., and Stanley F. Newman, San Francisco, and Robert H. Overcashier, Walnut Creek, Calif., assignors to Shell Oil Company, New York, N.Y.

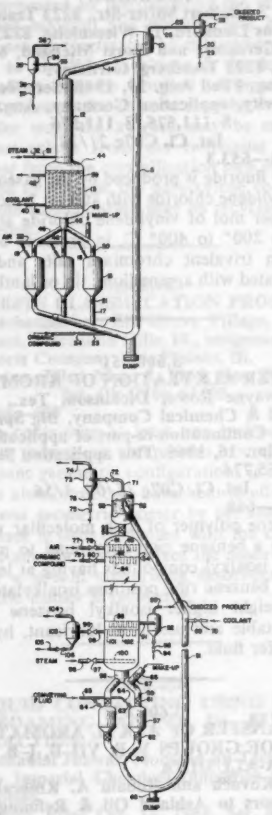
Filed Jan. 24, 1968, Ser. No. 700,199

Int. Cl. C07c *47/22, 57/04;* C07d *1/12, 5/34, 5/10*

U.S. Cl. 260—530 12 Claims

A process for carrying out partial oxidation of organic compounds in the vapor phase by circulating catalytic granular solids continuously through a system which includes vertically elongated up-flow and down-flow paths, one of which passes through an elongated reaction zone. The solids move as a compact bed, at least through the

reaction zone, and separate gaseous streams containing respectively an organic compound to be oxidized and oxygen are continuously admitted directly into the moving contact bed within the reaction zone at points spaced apart



in the direction of movement of the bed. The streams and contact bed are flowed co-currently through the reaction zone and the reacted mixture is separated from the bed after passage through at least a part of the length of one of the paths.

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3,600,441

## PROCESS FOR THE PRODUCTION OF OXAMIDE

**Theodor Lussling and Ferdinand Theissen, Grossauheim, and Wolfgang Weigert, Offenbach, Germany, assignors to Deutsche Gold- und Silber-Scheideansalt vormals Roessler, Frankfurt am Main, Germany**

**No Drawing. Filed Feb. 27, 1969, Ser. No. 803,065**

**Claims priority, application Germany, Mar. 2, 1968, P 16 93 012.4**

**Int. Cl. C07c** *97/00*

**U.S. Cl. 260—561** **10 Claims**

Oxamide is formed in good yields under anhydrous conditions employing (1) cyanogen, (2) a carboxylic acid and (3) a carboxylic acid halide or hydrogen halide. Preferably superatmospheric pressure is employed.

3,600,442

## METHOD OF RECOVERING VANILLIN FROM CRYSTALLIZATION LIQUORS

**Wayne Benjamin Gitchel, Rothschild, Donald Guy Diddams, Schofield, and Clarence Anthony Hoffman, Rothschild, Wis., assignors to American Can Company, New York, N.Y.**

**No Drawing. Filed Jan. 7, 1969, Ser. No. 789,599**

**Int. Cl. C07c** *47/58*

**U.S. Cl. 260—600** **6 Claims**

Vanillin is recovered from aqueous methanol crystallization mother liquors through selective precipitation by serially treating the crystallization liquors with amounts of alkali-metal hydroxide and a zinc or magnesium salt, preferably a zinc salt, stoichiometrically equivalent to the 5-formylvanillin present, causing the 5-formylvanillin to precipitate, and removing the precipitated 5-formylvanillin, and repeating these steps with the same agents in amounts at least stoichiometrically equivalent to the vanillin and acetovanillone present, thereby precipitating the vanillin and acetovanillone. The vanillin is then separated from the acetovanillone by the bisulfite method.

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3,600,443

## PROCESS FOR THE CATALYTIC OXIDATION OF LOWER OLEFINS TO CARBONYLS AND ACIDS

**Guidobaldo Cevidalli, Milan, Vahan Gurdjian, Mantova, Nicola Giordano, Milan, and Adriano Del Vesco, Mantova, Italy, assignors to Universal Oil Products Company, Des Plaines, Ill.**

**No Drawing. Continuation-in-part of application Ser. No. 536,148, Mar. 21, 1966, which is a continuation of application Ser. No. 119,312, June 26, 1961. This application Sept. 26, 1966, Ser. No. 581,718**

**Claims priority, application Italy, July 1, 1960, 11,695/60**

**Int. Cl. C07c** *45/04, 51/32*

**U.S. Cl. 260—604R** **5 Claims**

A process for the oxidation of ethylene and propylene to the corresponding aldehyde or acid in which a heteropolyacid or oxide is formed from a first component, an oxide of vanadium, tungsten and molybdenum, and a second component, an acid or oxide of boron, aluminum, silicon, titanium, germanium, zirconium, tin, cerium, phosphorus, arsenic, antimony, bismuth, sulphur, chromium, selenium, tellurium, manganese, iron, cobalt and nickel. The ethylene or propylene is brought into gas-solid contact with the solid catalyst on a support in the absence of any liquid phase for the contact time of 0.5 to 10 seconds at a temperature of 180° to 400° C., a pressure up to 10 atmospheres, a water vapor: olefin molar ratio of 1 to 10 and an oxygen: olefin ratio of 0.5 to 5.

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3,600,444

## HYDROXYARYLTHIO COMPOUNDS AND PROCESS OF PREPARATION

**Norman W. Dachs, Buffalo, N.Y., assignor to Hooker Chemical Corporation, Niagara Falls, N.Y.**

**No Drawing. Filed Aug. 5, 1968, Ser. No. 749,951**

**Int. Cl. A01n** *9/12;* **C07c** *149/36*

**U.S. Cl. 260—609** **18 Claims**

There are described hydroxyarylthio ethane and ethylene derivatives containing in the α-position to the hydroxyarylthio radical an alkoxy, aryloxy, alkaryloxy, aralkoxy, alkylcarboxy, arylcarboxy, alkylthio, arylthio, alkarylthio, aralkylthio, alkylcarbonylthio and arylcarbonylthio. A process for the preparation of said compounds and their pesticidal utility are also described.

3,600,445
## ORGANIC SCINTILLATORS
Hermann O. Wirth, Bingen-Budesheim, Werner Kern, Mainz (Rhine), Günter Herrmann, Mainz-Bretzenheim, and Fritz U. Herrmann, Marl, Germany, assignors to E. Merck AG, Darmstadt, Germany
No Drawing. Filed July 20, 1966, Ser. No. 566,489
Claims priority, application Germany, July 20, 1965, M 66,038
Int. Cl. C07c *43/20, 15/12*
U.S. Cl. 260—613 2 Claims

Organic scintillators having relatively high solubilities in homopolar solvents, comprising a variety of substituted oligoaryl compounds.

3,600,446
## HYDROXYLATION OF AROMATIC COMPOUNDS
Stephen N. Massie, Palatine, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.
No Drawing. Filed Dec. 23, 1968, Ser. No. 786,391
Int. Cl. C07c *39/02, 43/20*
U.S. Cl. 260—613D 9 Claims

Nuclear hydroxylation of aromatic compounds is effected by treating said aromatic compound with hydrogen peroxide in the presence of a co-reactant comprising hydrogen cyanide, a metal salt of hydrogen cyanide, or an organic nitrile at a temperature in the range of from about −10° to about 100° C.

3,600,447
## PREPARATION OF HYDROXYLATED AROMATIC COMPOUNDS
Jerome A. Vesely, Park Ridge, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.
No Drawing. Filed Dec. 20, 1965, Ser. No. 515,142
The portion of the term of the patent subsequent to Oct. 22, 1985, has been disclaimed
Int. Cl. C07c *39/00, 39/08, 39/10*
U.S. Cl. 260—621 8 Claims

Preparation of a hydroxylated aromatic compound by treating a t-alkyl substituted aromatic compound with $H_2O_2$ in the presence of a Friedel-Crafts catalyst at a temperature of −10° C. to 100° C.

3,600,448
## HALOALLYLIC COMPOUNDS AND THEIR PREPARATION
Gene C. Robinson, 1064 N. Leighton Drive, Baton Rouge, La. 70806
No Drawing. Continuation of application Ser. No. 536,604, Mar. 23, 1966. This application Aug. 6, 1969, Ser. No. 849,593
Int. Cl. C07c *39/26*
U.S. Cl. 260—623D 17 Claims

β-Haloallylic phenols are prepared by heating a gem-dihalocyclopropane, a phenolic compound having at least one ortho or para hydrogen substituent on the phenolic nucleus, and an alkali metal salt of a phenolic compound to a suitable reaction temperature (e.g., 100 to 200° C.). Novel β-haloallylic phenols are described. These are suitable for use as germicides, fungicides, pesticides, antioxidants, and intermediates for the synthesis of benzofurans.

3,600,449
## PREPARATION OF PRIMARY ALCOHOLS
Robert A. Dombro, Chicago, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.
No Drawing. Filed June 20, 1968, Ser. No. 738,419
The portion of the term of the patent subsequent to Dec. 24, 1985, has been disclaimed
Int. Cl. C07c *31/02, 31/16, 35/02*
U.S. Cl. 260—638R 8 Claims

Preparation of a primary alcohol by heating an ester of a terminal olefin and a carbothiolic acid in solution and at about 100°–300° C. with a cleaving agent, such as alkali metal or alkaline earth metal hydroxides or alkoxides, and a mild oxidizing agent, such as a sulfoxide.

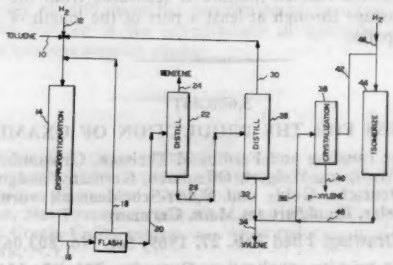
3,600,450
## PROCESS FOR PREPARING VINYLIDENE FLUORIDE
Franz Kaess, 7 Adalbert Stifter-Str., 8223 Traunstein, Germany; Klaus Lienhard, 11 Wiesenleite, 8223 Trostberg-Mogling, Germany; and Horst Michaud, 6 Dr. Albert Frank-Str., 8223 Trostberg, Germany.
No Drawing. Filed Aug. 29, 1968, Ser. No. 756,329
Claims priority, application Germany, Aug. 29, 1967, S 111,575, S 111,576
Int. Cl. C07c *21/18*
U.S. Cl. 260—653.3 4 Claims

Vinylidene fluoride is produced by the gaseous phase reaction of vinylidene chloride with at least 2 mols of hydrofluoric acid per mol of vinylidene chloride at a temperature of from 200° to 400° C. in presence of a catalyst selected from trivalent chromium salts and aluminum fluoride activated with a vanadium, tin or lanthanum compound.

3,600,451
## POLYMER ALKYLATION OF AROMATICS
Richard Duwayne Rowe, Dickinson, Tex., assignor to Cosden Oil & Chemical Company, Big Spring, Tex.
No Drawing. Continuation-in-part of application Ser. No. 440,281, Mar. 16, 1965. This application Sept. 5, 1969, Ser. No. 855,774
Int. Cl. C07c *15/04, 3/56*
U.S. Cl. 260—668 5 Claims

A polybutene polymer of high molecular weight is alkylated upon a benzene ring compound to produce heat stable higher isoalkyl compounds having at least one and usually more benzene ring positions isoalkylated to higher molecular weight higher isoalkyl benzene compounds highly heat stable and useful as lubricant, hydraulic oil, or heat transfer fluid.

3,600,452
## ALKYL TRANSFER OF ALKYL AROMATICS WITH METALS OF GROUPS V–B, VII–B, I–B, AND II–B ON BORIA-ALUMINA
Stephen M. Kovach and Ronald A. Kmecak, Ashland, Ky., assignors to Ashland Oil & Refining Company, Houston, Tex.
Filed Dec. 19, 1968, Ser. No. 785,194
Int. Cl. B01j *11/06;* C07c *3/58, 15/08*
U.S. Cl. 260—672 12 Claims




A process for the alkyl transfer of alkyl aromatics, including contacting an alkyl aromatic feed material, such as toluene, with a catalyst comprising a metal selected from Group I–B, such as copper or silver, Group II–B, such as zinc or cadmium, Group V–B, such as vanadium, and Group VII–B, such as manganese, and boria deposited on an alumina base at a temperature of about

800 to 1100° F., a pressure of about 0 to 2000 p.s.i.g., and a liquid hourly space velocity of about 0.1 to 10, and in the presence of hydrogen introduced at a rate of about 1 to 10 moles hydrogen per mole of hydrocarbon feed. Promoters selected from Group I, Group II, Group IV, and the rare earth metals of the Periodic System may be added to the catalyst. Deactivated catalyst may be periodically rejuvenated by discontinuing the introduction of aromatic feed material and purging with hydrogen and the catalyst can be reactivated by calcination in an atmosphere such as air. Where toluene is the feed, the alkyl transfer product may be distilled to separate benzene, toluene and xylenes, the toluene may be recycled to the alkyl transfer step, the xylenes may be crystallized to separate para-xylene from the remaining xylenes, the mother liquor from the crystallization step may thereafter be isomerized to readjust the para-xylene content and the product of the isomerization may be recycled to the crystallization zone.

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3,600,453

## OLEFIN CLASSIFICATION PROCESS

**Paul H. Reichenbacher, Elk Grove Village, and Armand J. de Rosset, Clarendon Hills, Ill., assignors to Universal Oil Products Company, Des Plaines, Ill.**

**No Drawing. Filed Mar. 5, 1969, Ser. No. 804,684**

**Int. Cl. C10g *43/08***

**U.S. Cl. 260—677** **6 Claims**

A stream containing at least one hydrocarbon isomer selected from the organic compounds having double bonds in cis and trans geometric configurations is contacted with a crystalline aluminosilicate adsorbent to effect adsorption of at least one geometric isomer by the adsorbent. A desorbent stream is then contacted with the crystalline aluminosilicate adsorbent to displace the adsorbed geometric isomer and a stream comprising desorbent and at least one geometric isomer is recovered.

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3,600,454

## GAS-LIQUID CONTACTING USING SILICONE ANTIFOAMING AGENT IN BUTADIENE EXTRACTION

**Pannalal Sohanlal Jhawar, Stockton-on-Tees, England, assignor to Imperial Chemical Industries Limited, London, England**

**No Drawing. Filed Oct. 10, 1969, Ser. No. 865,509**

**Claims priority, application Great Britain, Oct. 14, 1968, 48,618/68**

**Int. Cl. B01d *3/40*; C07c *7/08, 11/16***

**U.S. Cl. 260—681.5** **12 Claims**

Gases, for example mixtures of hydrocarbons, are contacted with a liquid selected from dimethylformamide, dimethylacetamide and saturated heterocyclic compounds having 5- or 6-membered rings in which the hetero atom is oxygen or nitrogen, for example N-methylpyrrolidone, and an antifoaming agent, for example a silicone. The process reduces foaming in processes such as the solvent extraction of butadiene, allowing increased extraction rates.

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3,600,455

## PRODUCTION OF 4-METHYL PENTENE-1

**Fred Dean, Stockton-on-Tees, England, assignor to Imperial Chemical Industries Limited, London, England**

**No Drawing. Filed Dec. 9, 1969, Ser. No. 883,586**

**Claims priority, application Great Britain, Dec. 19, 1968, 60,425/68**

**Int. Cl. B01j *11/58*; C07c *1/24***

**U.S. Cl. 260—682** **4 Claims**

A process for producing 4-methyl pentene-1 which comprises dehydrating 4-methyl pentan-1-ol or 4-methyl pentan-2-ol by passing it over a dehydration catalyst comprising alkalised alumina.

3,600,456

## PRODUCTION OF $C_7$–$C_{20}$ OLEFINS

**Christopher Patrick Cadman Bradshaw, Sunbury-on-Thames, Middlesex, England, assignor to The British Petroleum Company Limited, London, England**

**No Drawing. Filed Dec. 5, 1968, Ser. No. 781,616**

**Claims priority, application Great Britain, Jan. 8, 1968, 1,050/68**

**Int. Cl. C07c *3/62***

**U.S. Cl. 260—683D** **12 Claims**

$C_{7-20}$ olefins are prepared by contacting olefins of carbon number $C_3$ or higher with a disproportionation catalyst comprising rhenium heptoxide or rhenium carbonyl supported on a metal oxide, and an isomerisation catalyst e.g. potassium on alumina.

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3,600,457

## SHORT CYCLE CATALYTIC DEHYDROGENATION OF ALKANES

**Avery D. Milloy, Beacon, and Edwin R. Kerr, Wappingers Falls, N.Y., assignors to Texaco Inc., New York, N.Y.**

**No Drawing. Filed Feb. 24, 1969, Ser. No. 801,858**

**Int. Cl. C07c *5/18, 3/28***

**U.S. Cl. 260—683.3** **7 Claims**

Normal alkanes are catalytically dehydrogenated in a two period cyclic operation alternating between a reaction period of less than 60 seconds and a regeneration period 1 to 10 times as long. A mixture of steam and alkane passes through the catalyst during the reaction period while a mixture of steam and air is used to reactivate the catalyst during the regeneration period.

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3,600,458

## SHAPED STRUCTURES

**Saunders E. Jamison, Summit, N.J., assignor to Celanese Corporation, New York, N.Y.**

**No Drawing. Continuation-in-part of application Ser. No. 611,468, Jan. 24, 1967, which is a continuation of application Ser. No. 364,349, Apr. 10, 1964, which in turn is a division of application Ser. No. 62,534, Oct. 4, 1960, now Patent No. 3,231,543. This application Sept. 13, 1968, Ser. No. 759,791**

**Int. Cl. C08g *45/06***

**U.S. Cl. 260—830** **7 Claims**

This application discloses a process of preparing a self-supporting shaped structure which comprises polymerizing a solid phase monomer in the presence of a fluid catalyst. Specifically, trioxane is mixed with a resinous binder and then polymerized in the presence of boron fluoride. Also disclosed is the copolymerization of trioxane with diepoxides.

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3,600,459

## COATING COMPOSITIONS CONTAINING A POLYESTER COMPOSITION, AN EPOXY RESIN AND AN AMINOPLAST RESIN

**Joseph A. Vasta, Woodbury, N.J., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.**

**No Drawing. Filed May 13, 1968, Ser. No. 728,773**

**Int. Cl. C08g *17/007***

**U.S. Cl. 260—834** **9 Claims**

Novel polyester compositions resulting from the esterification reaction of two or more dicarboxylic acids or anhydrides, a glycidyl ester, a glycol and a polyol selected from the group consisting of trimethylol ethane, trimethylol propane, glycerine and pentaerythritol are provided for use in formulating thermosetting coating compositions by blending the polyester compositions with an epoxyhydroxy polyether condensate and an aminoplast resin for ultimate use in coating industrial appliances.

3,600,460

## THERMOPLASTIC REACTION PRODUCT OF A LINEAR SATURATED POLYESTER AND A POLYALKYLENE-DIOL

Ludwig Brinkmann and Helmut Fröhlich, Frankfurt am Main, Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany

No Drawing. Filed Sept. 20, 1968, Ser. No. 761,315
Claims priority, application Germany, Oct. 7, 1967, P 17 20 723.7
Int. Cl. C08f *29/10;* C08g *17/06, 39/10*
U.S. Cl. 260—860 12 Claims

Thermoplastic moulding compositions comprising linear saturated polyesters and polyalkylene-diols which can be moulded into shaped articles having a high impact strength and bending strength.

3,600,461

## VINYL HALIDE POLYMERIC BLENDS

Yoon Chai Lee, Springfield, Mass., assignor to Monsanto Company, St. Louis, Mo.

No Drawing. Filed Aug. 5, 1968, Ser. No. 749,942
Int. Cl. C08f *29/24, 37/18, 41/12*
U.S. Cl. 260—876R 13 Claims

A polymeric blend is prepared from a vinyl halide polymer and an interpolymer of a dicyanobutene-1. The blends exhibit low oxygen permeability and a superior balance of heat resistance and processability while maintaining or improving other properties, including toughness.

3,600,462

## OLEFIN POLYMER BLEND WITH DICARBOXYLIC ACID OF BLOCK COPOLYMER OF α-METHYL STYRENE AND ALIPHATIC CONJUGATED DIOLEFIN

Thomas O. Harmon, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

No Drawing. Filed Sept. 5, 1968, Ser. No. 757,796
Int. Cl. C08f *29/12, 29/36, 29/50*
U.S. Cl. 260—876 10 Claims

A composition of matter comprising a blend of an olefin polymer such as polyethylene and a dicarboxylic acid of a block copolymer of α-methyl styrene and an aliphatic conjugated diolefin such as 1,3-butadiene has the characteristics of a cross-linked polymer. The composition of matter is prepared by blending or otherwise mixing the olefin polymer and the dicarboxylic acid block copolymer in relative proportions such that the final product has at least about 0.5 percent by weight dicarboxylic acid block copolymer. The composition of matter is useful for providing a protective coating on a substrate of metal or the like.

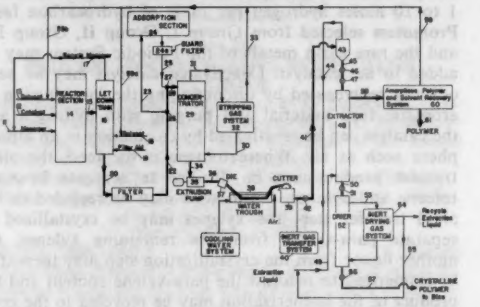
3,600,463

## PROCESS FOR PRODUCING SUBSTANTIALLY ASH-FREE POLYOLEFIN POLYMERS

Hugh J. Hagemeyer, Jr., David C. Hull, and Samuel J. Park, Longview, Tex., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of application Ser. No. 636,118, May 4, 1967. This application Dec. 18, 1967, Ser. No. 695,820
Int. Cl. C08f *47/00*
U.S. Cl. 260—878B 11 Claims

Processes for polymerizing alpha olefinic hydrocarbons comprising polymerizing an alpha olefin with a solid stereospecific catalyst in the presence of a diluent which is a solvent for the poly-alpha-olefin at the reaction temperature to produce a polymer solution containing catalyst residues. The polymer solution is filtered to remove catalyst residues. The filtered solution is contacted with alumina and concentrated to form a solid polymer concentrate containing residual solvent. Pellets are formed of the polymer concentrate and the pellets extracted with a solvent for amorphous low molecular weight polymer



to produce a highly crystalline polymer substantially free of impurities.

3,600,464

## SOLVENT RESISTANT VINYL-PYRIDINE BLOCK POLYMER DERIVATIVES AND THEIR PREPARATION

Ralph H. Bauer, Huntington Beach, and Alfred W. Shaw, Moraga, Calif., assignors to Shell Oil Company, New York, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 361,256, Apr. 20, 1964. This application Oct. 3, 1968, Ser. No. 764,929
Int. Cl. C08f *15/02*
U.S. Cl. 260—879 5 Claims

Novel block copolymer derivatives, resistant to nonpolar organic solvents, are disclosed. These comprise block copolymers of the group consisting of block copolymers having at least three polymer blocks, at least two of the blocks being polymerized vinyl-pyridine compounds, dissimilar to the adjacent blocks, and at least one of the blocks being polymerized conjugated diene, and hydrogenated derivatives the copolymers, at least 50% of the heterocyclic nitrogen atoms being reaction products with mineral acids.

3,600,465

## THERMOPLASTIC MOULDING COMPOSITIONS

Karl-Heinrich Knapp, Leverkusen, and Karl-Heinz Ott, Karl Dinges, and Werner Scholtan, Cologne-Stammheim, Germany (all % Farbenfabriken Bayer AG, Leverkusen, Germany)

Continuation of application Ser. No. 479,671, Aug. 13, 1965. This application Oct. 22, 1968, Ser. No. 769,762
Claims priority, application Germany, Oct. 7, 1964, F 44,156
Int. Cl. C08f *15/04, 15/18*
U.S. Cl. 260—880 2 Claims

Thermoplastic moulding compositions from butadiene, styrene and acrylonitrile having improved notched impact strengths and prepared from 5 to 60% by weight of butadiene polymer, containing up to 30% of copolymerized monomers, and 95 to 40% by weight of polymerized styrene and acrylonitrile in a weight ratio from 90:10 to 50:50.

3,600,466

## PROCESS FOR THE PREPARATION OF PURE-WHITE POLYSTYRENE COMPOSITIONS

Eichi Moriguchi, Takeshi Goto, Michikazu Hiraoka, Teruhisa Mitsumori, and Shonosuke Rokudo, Tokyo, Japan, assignors to Denki Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

No Drawing. Filed June 16, 1967, Ser. No. 646,477
Int. Cl. C08f *1/04, 1/11;* C08d *15/04*
U.S. Cl. 260—880 3 Claims

Pure-white polystyrene compositions having high impact resistance and good heat resistance are prepared by a

two step graft polymerization, that is, by conducting a bulk polymerization of a mixture of a styrene monomer and polybutadiene at 80–120° C., with the conversion ratio of 20–40% of the styrene monomer with the addition of, if necessary, less than 0.2% by weight of dicumyl peroxide, conducting a suspension polymerization of the product, after mixing the product with an aqueous solution of a dispersing agent, at 105–125° C., with the addition of dicumyl peroxide, in an amount such that the total amount of the catalyst is 0.05–0.5% by weight until the conversion ratio reaches more than 70%, and then conducting further polymerization at 125–140° C. The uniformity of the product beads can be further improved by using as the dispersing agent a partially saponified vinyl acetate-dodecylvinyl ether copolymer.

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3,600,467

## PROCESS OF PREPARING GRAFT INTERPOLYMERS

**Jules Darcy, Sarnia, Ontario, and Paul Grenville Palmer, Acton, Ontario, Canada, assignors to Polymer Corporation Limited, Sarnia, Ontario, Canada**

**No Drawing. Filed Nov. 17, 1967, Ser. No. 683,810**
**Claims priority, application Canada, Nov. 28, 1966, 976,538**
**Int. Cl. C08f *15/04***
**U.S. Cl. 260—880** **6 Claims**

Graft interpolymers of a vinyl aromatic monomer such as styrene, a butadiene-1,3 hydrocarbon and a vinyl nitrile monomer such as acrylonitrile are prepared by polymerization of the grafting monomers in the presence of the butadiene-1,3 hydrocarbon in solution in an aromatic hydrocarbon solvent, to a predetermined conversion of from 20–40%.

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3,600,468

## ADHESIVE BLEND COMPRISING AN ETHYLENE/UNSATURATED ACID COPOLYMER AND AN ETHYLENE/UNSATURATED ESTER COPOLYMER

**Reinhard D. Böhme, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.**

**No Drawing. Filed Oct. 31, 1968, Ser. No. 772,376**
**Int. Cl. C08f *37/18***
**U.S. Cl. 260—897** **7 Claims**

An adhesive blend of polymers having an adhesiveness in terms of peel strength greater than the sum of the peel strengths of each polymer in the blend comprising a copolymer of ethylene and an $\alpha,\beta$-ethylenically unsaturated carboxylic acid such as acrylic acid and a copolymer of ethylene and an alkyl ester of an $\alpha,\beta$-ethylenically unsaturated carboxylic acid such as ethyl acrylate. The adhesive blend is prepared by masticating the copolymers in a Banbury mixing apparatus or the like.

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3,600,469

## COATING COMPOSITIONS OF CHLOROSULFONATED POLYETHYLENE AND CHLORINATED ISOTACTIC POLYPROPYLENE

**Koichi Sato, Suita-shi, Akira Niki, Hirakata-shi, and Masanobu Morimoto, Ibaragi-shi, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan**

**No Drawing. Filed Feb. 18, 1969, Ser. No. 800,295**
**Claims priority, application Japan, Feb. 23, 1968, 43/11,092**
**Int. Cl. C08f *29/12, 29/22***
**U.S. Cl. 260—897C** **3 Claims**

A coating composition capable of affording a coating film having an improved surface adhesive property, comprising 100 parts by weight of a vulcanizable noncrystalline chlorosulfonated polyethylene, 15–45 parts by weight of tribasic lead maleate, 5–50 parts by weight of chlorinated isotactic polypropylene and, optionally, organic acids and vulcanization accelerators.

3,600,470

## HYDROXY OR ALKOXY PHOSPHONATE COMPOSITIONS AND AMINE SALTS THEREOF

**Morton Lewis, Elmhurst, Ill., assignor to Swift & Company, Chicago, Ill.**

**No Drawing. Filed Oct. 27, 1967, Ser. No. 678,546**
**Int. Cl. C07f *9/40*; C09k *3/00*; C08f *5/58***
**U.S. Cl. 260—924** **13 Claims**

Hydroxy substituted phosphonates are produced by reacting a halohydrin with an aliphatic or aromatic phosphite. At high temperatures, an acidic compound is formed instead of, or at least substantially in place of the neutral compound. The neutral ester of the phosphonic acid can be subjected to either acidic or basic hydrolysis to form the free phosphonic acid, which in turn can react with alkyl amines or alkylol amines to form excellent corrosion inhibitors. The neutral esters themselves can be used as additives for extreme pressure lubricants.

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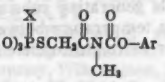
3,600,471

## N - α - DIALKOXYPHOSPHINOTHIOACETYL-N-METHYLCARBAMATES OF PHENOLS AND THEIR USE AS PESTICIDES

**Albert H. Haubein, Newark, Del., assignor to Hercules Incorporated, Wilmington, Del.**

**No Drawing. Continuation-in-part of application Ser. No. 646,486, June 16, 1967, which is a continuation-in-part of application Ser. No. 567,064, July 22, 1966, both now abandoned. This application July 9, 1968, Ser. No. 743,322**
**Int. Cl. A01n *9/36*; C07f *9/18***
**U.S. Cl. 260—938** **14 Claims**

Compounds, useful as pesticides, of the formula



in which X is O or S, R is methyl or ethyl and Ar is phenyl or substituted phenyl. A representative compound is m-isopropylphenyl N-α-dimethoxyphosphinodithioacetyl-N-methylcarbamate.

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3,600,472

## O-(2,5 - DICHLORO-4-ALKYLMERCAPTOPHENYL) THIONOPHOSPHATES AND THIONOPHOSPHONATES

**Richard Sehring and Wolfgang Buck, Ingelheim (Rhine), Germany, assignors to C. H. Boehringer Sohn, Ingelheim (Rhine), Germany**

**No Drawing. Filed Nov. 15, 1967, Ser. No. 683,125**
**Claims priority, application Germany, Nov. 22, 1966, B 89,951; July 11, 1967, B 93,427**
**Int. Cl. A01n *9/36*; C07f *9/18, 9/40***
**U.S. Cl. 260—949** **8 Claims**

The compounds are O-(2,5-dichloro-4-alkylmercaptophenyl) - thionophosphates and analogous thionophosphonates, useful as insecticides and acaricides.

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3,600,473

## PHOSPHATE ESTER-β-CAROTENE PRECURSORS

**Joseph Donald Surmatis, West Caldwell, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.**

**No Drawing. Application July 11, 1968, Ser. No. 743,979, which is a division of application Ser. No. 416,128, Dec. 4, 1964. Divided and this application July 16, 1970, Ser. No. 55,583**
**Int. Cl. C07f *9/40***
**U.S. Cl. 260—956** **2 Claims**

The compound diethyl 9-[2,6,6-trimethyl-1-cyclohexen-1-yl]-3,7-dimethyl-2,6,8-nonatrien-4-yne phosphonate, and its dehydrogenated products which are intermediates in the preparation of trans-β-carotene from oxenin or isooxenin.

3,600,474
## CYCLOBUTENE PHOSPHORIC ACID ESTERS
Beat Böhner and Kurt Rüfenacht, Basel, Switzerland, assignors to Geigy Chemical Corporation, Ardsley, N.Y.
No Drawing. Filed Nov. 17, 1967, Ser. No. 683,784
Claims priority, application Switzerland, Nov. 21, 1966, 16,667/66
Int. Cl. C07f 9/08, 9/22, 9/40
U.S. Cl. 260—957 9 Claims

Phosphoric acid esters which contain as esterifying radical a cyclobutenol radical which is fused to a ring system are produced from novel intermediates which are α-halogeno-cyclobutanones fused to a ring system. The esters are useful as pesticides; a method of controlling pests with the aid of the compounds as well as pesticidal compositions containing them as active ingredients are also described.

3,600,475
## PROCESS FOR PREPARING 2-CHLOROETHANE-PHOSPHONIC ACID ESTERS
Kurt Schimmelschmidt, Frankfurt am Main, and Hans-Jerg Kleiner, Bad Soden, Taunus, Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany
No Drawing. Filed Mar. 7, 1968, Ser. No. 711,181
Claims priority, application Germany, Mar. 9, 1967, F 51,763
Int. Cl. C07f 9/40
U.S. Cl. 260—970 3 Claims

Process for preparing 2-chloroethane-phosphonic acid esters by reacting vinyl chloride at about normal pressure with diethyl phosphites or diethyl thiophosphites in the presence of radicals generating substances and/or ultraviolet radiation at a temperature between about 120° and 200° C. and under inert atmosphere and in absence of oxygen.

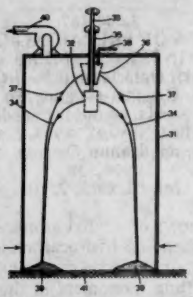
3,600,476
## METHOD FOR MANUFACTURE OF LIGHT WEIGHT AGGREGATES
Takamura Suzuki, Tokyo, and Haruo Inagaki, Shoji Shishido, and Tadahiko Ara, Yokohama, Japan, assignors to Kanagawa Prefectural Government, Yokohama, Japan
No Drawing. Filed Sept. 10, 1969, Ser. No. 856,819
Claims priority, application Japan, Sept. 18, 1968, 43/66,976
Int. Cl. C04b 31/00
U.S. Cl. 263—52 8 Claims

A method for the manufactuer of coated-type light weight aggregates which comprises mixing a siliciferous material, particularly a material such as fly ash which in itself is low in plasticity, with sludge from a sewage-treating plant and, if necessary, with sodium silicate or the like as an auxiliary binder, granulating the resultant mixture into pellets, and burning the pellets in a rotary kiln.

3,600,477
## PROCESS FOR GRANULATING EXPLOSIVE COMPOSITIONS
Lutz Friedel, Steyerberg, Gerhard Lindner, Holtorf, and Bruno Rohe, Steyerberg, Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Germany
Filed Dec. 24, 1968, Ser. No. 786,678
Claims priority, application Germany, Jan. 16, 1968, P 16 67 011.4
Int. Cl. C06b 21/02
U.S. Cl. 264—3 10 Claims

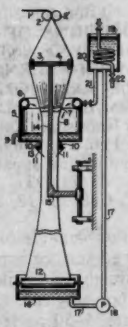
The present disclosure relates to a process and apparatus for the granulation of materials, for example suspensions of explosives, wherein said materials are introduced into a granulating vessel onto the surface of a rotating disk which flings the materials against the walls of said granulating vessel. Advantageously, water or another suitable liquid is also introduced onto the surface of the rotating disk and is likewise flung against the wall of the granulating vessel together with the materials to be granulated. The addition of a fluid such as water during the process provides a maximum degree of safety during the operation.

3,600,478
## SIMULTANEOUS PREPARATION OF UREA GRANULES OF TWO SIZES
Franciscus A. Kars, Beukenboomweg 8, Sittard, Netherlands
Filed May 8, 1969, Ser. No. 822,882
Int. Cl. B01j 2/02
U.S. Cl. 264—8 2 Claims



There is provided a process for the preparation of urea granules, so-called prills. Drops of liquid urea are allowed to solidify to granular product during a free fall with direct cooling. The drops of liquid urea supplied from a perforated rotary vessel are solidified during the free fall in the presence of urea drops from a second perforated rotary vessel, the perforations in which have such a diameter that the mean diameter of the drops issuing from it is at most half that of the former drops. The solidified droplets are collected together and classified according to size. If two types of urea prills are produced, urea of different biuret contents can be supplied to each of the rotary vessels.

3,600,479
## METHOD FOR UNIAXIALLY AFTER-STRETCHING A TUBULAR FILM
Masahide Yazawa and Haruhisa Tani, Tokyo, Japan, assignors to Polymer Processing Research Institute Ltd., Tokyo, Japan
Filed Oct. 30, 1969, Ser. No. 872,579
Claims priority, application Japan, Nov. 12, 1968, 43/82,729
Int. Cl. B29d 7/16, 7/24
U.S. Cl. 264—25 14 Claims



Method for producing at least one sheet of uniaxially oriented film having no appreciable extent of biaxial molecular orientation which is harmful to fibrillation, by

after-stretching a tubular film longitudinally in the original tubular state during the pass from feeding pinch rollers to take-up pinch rollers in the primary after-stretching, which comprises sliding it over the outside periphery of a horizontal circular guide mounted on a vertical elongated support at a temperature as close to room temperature as possible in order to recover the original round state from a flatly folded state; heating it uniformly up to a temperature sufficient for after-stretching so as to start rapid stretching all at once from a circumference lying at substantially the same level and cleaving the stretched film. The invention also may include the above-mentioned primary after-stretching and the secondary stretching carried out at a higher temperature than the primary after-stretching between another set of feeding pinch rollers and taking-up pinch rollers.

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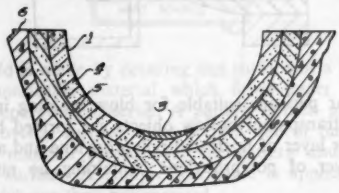
**3,600,480**
**PROCESS FOR REPAIRING RUNNERS FOR HANDLING MOLTEN METAL**
**Joseph R. Parsons, Park Forest, Ill., assignor to Chicago Fire Brick Company**
**Filed May 15, 1969, Ser. No. 824,862**
**Int. Cl. C04b** *35/52, 35/54*
**U.S. Cl. 264—30** **5 Claims**



A patch composition consisting essentially of particles of pitch and particles of carbon such as particles of coke, graphite or coal is filled into the recess of the damaged portion of a runner trough of a blast furnace or cupola while the trough is at a temperature above 500° F. but below the carbonization temperature of the pitch, and then the patch is further heated by a gas flame or other means to a temperature sufficient to carbonize of coke the pitch, this forming a solid patch of carbon. Small amounts of calcium chloride, clays, bentonite or liquid pitch may be added to the patch particle composition especially to relieve the dusting problem when fine particles of carbon such as 60 mesh or finer are used.

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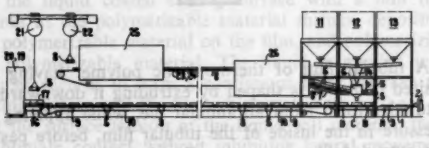
**3,600,481**
**METHOD FOR MORE RAPIDLY PRODUCING AEROCONCRETE BUILDING ELEMENTS**
**Walter Lanz, 601 Kleinfeld, 2563 Ipsach, Switzerland**
**Continuation of application Ser. No. 642,038, May 29, 1967. This application Nov. 26, 1969, Ser. No. 873,747**
**Claims priority, application Austria, June 8, 1966, A 5,454/66**
**Int. Cl. C04b** *15/02, 15/12*
**U.S. Cl. 264—42** **2 Claims**



A method for continuously producing building elements of aeroconcrete, wherein components of a multi-part form include bottom portions which are recirculated to a filling station after setting of the elements being produced while frames and inserts of the multi-part forms are recirculated after stabilization of the aeroconcrete which has been poured, and prior to the use are cleaned and greased.

By using a mixture of aluminum and limestone powders as the blowing agent and by preheating the concrete mixture to about 20–35° C., the aeroconcrete is stabilized sufficiently to permit removal of the die frames within about 36 minutes after pouring.

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**3,600,482**
**METHOD OF FORMING A MAT OF FIBROUS GELATIN**
**Ival O. Salyer and James L. Schwendeman, Dayton, Ohio, assignors to Monsanto Research Corporation, St. Louis, Mo.**
**No Drawing. Continuation-in-part of application Ser. No. 606,001, Dec. 30, 1966. This application Jan. 15, 1970, Ser. No. 3,232**
**Int. Cl. B29d** *27/00*
**U.S. Cl. 264—50** **4 Claims**

A process for preparing light, porous mats of gelatin fibers which comprises producing a low-density foam from a 3–25% gelatin solution containing a surfactant, bringing said foam to a temperature at which gelation occurs, drying said foam, and crushing the membranes of said foam. The mats are useful packaging and insulating materials, filters and thermoplastic adhesives.

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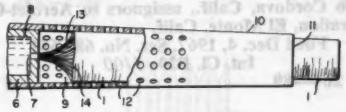
**3,600,483**
**PROCESS OF FLASH SPINNING AND COLLECTING PLEXIFILAMENT TO FORM ROD-SHAPED BACK-WINDABLE BATT**
**Thomas Wade Davis, Petersburg, and Robert John Gilardi, Richmond, Va., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.**
**Original application Sept. 30, 1964, Ser. No. 400,353, now Patent No. 3,413,185, dated Nov. 26, 1968. Divided and this application June 17, 1968, Ser. No. 810,040**
**Int. Cl. B29d** *27/00;* **D01d** *5/04*
**U.S. Cl. 264—53** **6 Claims**



Flash-spun plexifilament is collected by allowing the network to expand in an elongated passageway adjacent the extrusion orifice and impinge on a yieldable surface whereby the network folds upon itself to form a rod-shaped back-windable batt. The passageway is at a pressure lower than that of the solution prior to extrusion and preferably above atmospheric. The cross-section of the passageway governs the size and shape of the cross-section of the expanded network.

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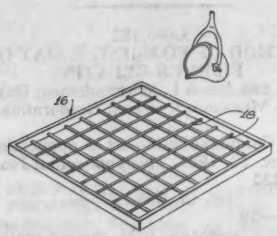
**3,600,484**
**SINTERING FERROELECTRIC MATERIALS SUCH AS BARIUM TITANITE IN A VACUUM**
**Edward I. Smoke, Edison, and Howard Wichansky, Eatontown, N.J., assignors to the United States of America as represented by the Secretary of the Army**
**No Drawing. Filed Feb. 6, 1969, Ser. No. 797,237**
**Int. Cl. C04b** *35/00, 35/64*
**U.S. Cl. 264—65** **2 Claims**

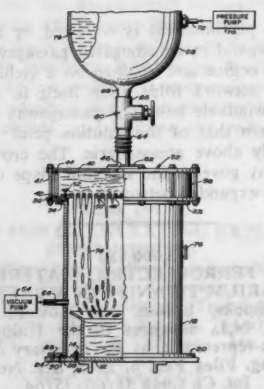
The dielectric properties of ferroelectric materials such as barium titanate are upgraded by sintering the dry pressed shapes in a vacuum having partial air pressures of 1 to 1000 microns. Maintaining the vacuum during cooling is optional.

3,600,485
**METHOD OF PRODUCING SYNTHETIC STONE MEMBERS SIMULATING MOSAICS**
Shlomo Brauner, 46 Yahalom, Ramat Gan, Israel
Filed May 22, 1967, Ser. No. 640,307
Claims priority, application Israel, May 26, 1966, 25,848
Int. Cl. B29c 9/00
U.S. Cl. 264—74 3 Claims



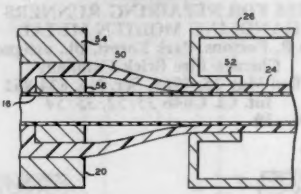

A method of producing synthetic stone members simulating mosaics is described, in which there is provided a mould having partitions dividing the bottom into a plurality of compartments, introducing into the compartments a layer of a liquid transparent material, a layer of a colored liquid plastic material, and then a layer of a backing material. According to a further feature the colored layer may be produced by pouring the plastic material through a screen having a plurality of spaced strands coated with coloring matter. The transparent and the colored layers are of an unsaturated polyester resin, the backing layer also including an unsaturated polyester resin, but further including styrene and particles of quartz, zircon, stone or plaster.

3,600,486
**PRESSURE CASTING PROCESS**
Lloyd A. Walker, Placerville, and Rudolph A. Peterson, Rancho Cordova, Calif., assignors to Aerojet-General Corporation, El Monte, Calif.
Filed Dec. 4, 1967, Ser. No. 687,651
Int. Cl. B29c 5/00
U.S. Cl. 264—89 5 Claims




A pressure casting apparatus for casting highly viscous material having a casting mold within a vacuum bell, whereby the vacuum prevents voids in the cast material and reduces the pressurization otherwise required on a transfer pot containing the material to be cast. The transfer pot is operably connected to a pressure casting head having pattern holes in the bottom thereof, which casting head forms the top of the vacum bell above the casting mold. The casting process is performed by drawing a vacuum in the bell, pressurizing the transfer pot, forcing the material from the transfer pot through the casting head, and dropping the extruded material into the casting mold for curing.

3,600,487
**FORMING PARISONS WITH NUCLEATED INNER LAYER**
Fredrick Zavasnik, Chicago, Ill., assignor to Phillips Petroleum Company
Filed Sept. 8, 1969, Ser. No. 855,801
Int. Cl. B29c 17/07
U.S. Cl. 264—89 9 Claims




Tubular parisons suitable for blow molding into high strength transparent hollow objects are formed having a thin inner layer of nucleated polypropylene and a thicker outer layer of polypropylene containing no nucleating agent.

3,600,488
**METHOD FOR SHAPING A TUBULAR FILM BY LIQUID COAGULATION**
Masahide Yazawa, Tokyo, Japan, assignor to Polymer Processing Research Institute Ltd., Tokyo, Japan
Filed July 18, 1969, Ser. No. 842,996
Claims priority, application Japan, July 26, 1968, 43/52,864
Int. Cl. B29d 7/20
U.S. Cl. 264—95 8 Claims

A tubular film of thermoplastic polymer having any desired diameter is shaped by extruding it downwards in a tubular form from an annular die, while applying gas pressure in the inside of the tubular film, before passing the extruded film, so as to effect complete coagulation, through the inside of a cylindrical net provided in contact with a coagulation liquid which is supplied from the top of the net and flowing downwards along the surface

of the net and by withdrawing the coagulated film from the lower part of the net. By adjusting the tension of the cylindrical net, the tubular film is always in light contact with a turbulent stream of the coagulating liquid without channelling of the stream, and the tubular film of any desired diameter and thickness can be readily prepared in the same apparatus.

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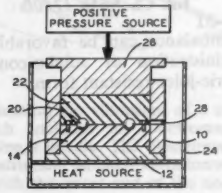
3,600,489

## METHOD OF MAKING A MOLD

Richard Posner, East Northport, N.Y., assignor to Creative Polymer Products Corp., Long Island City, N.Y.

Filed Nov. 25, 1968, Ser. No. 784,998
Int. Cl. B29c 27/22
U.S. Cl. 264—135 1 Claim




A mold is made by covering one surface of a first slab of polymerizable material which flows under pressure with a separating material. A pattern is then placed on this so-covered surface and a second slab of the polymerizable material placed over the pattern and the so-covered surface. A compressive force is applied to the slabs which are then polymerized.

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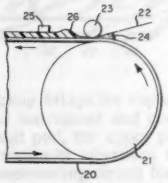
3,600,490

## PROCESS OF FORMING A RIPPLE-FREE STRUCTURE FROM A POLYMERIZABLE MATERIAL THAT SHRINKS UPON POLYMERIZATION

John G. S. Billingsley, Newark, Del., and David E. Nickles, Williamsville, N.Y., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed July 23, 1969, Ser. No. 843,985
Int. Cl. B29d 7/02
U.S. Cl. 264—171 11 Claims




A process for casting a structure having at least one ripple-free surface from a polymerizable material that shrinks upon polymerization which comprises coating a substantially smooth casting surface with a liquid, covering the liquid coated casting surface with a film that shrinks as the polymerizable material shrinks, depositing the polymerizable material on the film, and polymerizing the polymerizable material. The liquid is applied in a manner such as to form a continuous layer between the casting surface and the film which wets both surfaces, so that the surface tension of the liquid will maintain them in intimate contact without inhibiting lateral movement of the film relative to the casting surface. Continuous casting and a process for casting structures having both surfaces ripple free are also provided for.

3,600,491

## PRODUCTION OF HOLLOW ACRYLIC FIBERS

Keitaro Shimoda and Keitaro Pukushima, Saidaiji, Japan, assignors to Japan Exlan Company Limited

Filed Jan. 28, 1969, Ser. No. 794,696
Claims priority, application Japan, Feb. 14, 1968, 43/9,527
Int. Cl. B28h 21/54; D01d 7/00
U.S. Cl. 264—177F 5 Claims

Process for producing hollow acrylic synthetic fibers by extruding a spinning solution of an acrylic polymer and a concentrated aqueous solution of an inorganic salt through spinning orifices into an inert gaseous medium which is incapable of coagulating the spinning solution, each spinning orifice having a continuous central portion substantially enclosed by a slit (see figures) and coagulating the thus-formed hollow current of the spinning solution within which is enclosed the inert gas.

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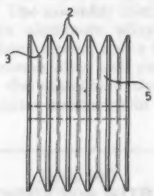
3,600,492

## PROCESS AND DEVICE FOR THE MANUFACTURE OF MONOFILAMENTS OF CIRCULAR CROSS-SECTION MADE OF SYNTHETIC LINEAR HIGH-POLYMERS

Gunther Vock, Augsburg, Hans Seelig, Schwabmunchen, and Dieter Paulin, Bobingen, Germany, assignors to Farbwerke Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Mar. 10, 1969, Ser. No. 805,506
Claims priority, application Germany, Mar. 14, 1968, P 17 10 620.6
Int. Cl. D01d 5/08
U.S. Cl. 264—178F 8 Claims




Process for the manufacture of monofilaments of circular cross-section made of synthetic, linear high-polymers by spinning said high-polymers through circular spinneret openings into a liquid bath and deviating the freshly spun monofilament in the bath on their path of travel to the takeup on a deviating device designed as turnable guiding element, which conducts the monofilaments along the curve performed by them without guidance in the liquid bath on their path of travel to the take away into guide grooves designed as rounded off, wedge-shaped grooves whose bottoms have as radii of curvature the radii of the undrawn monofilaments, one guide groove being provided for each monofilament. As the deviating device there is used an easily turning roller or a disposition of several easily turning small rollers which have parallel axes. The monofilaments are guided into grooves which have to be exactly adjusted to the diameters of these monofilaments; said disposition of one or several small deviating rollers for carrying out the process of the invention also constituting an object of the present invention.

3,600,493

## METHOD FOR DRAWING FIBERS COMPRISED OF CELLULOSE ACETATE-POLYMER BLENDS

Michael Maurice Besso, West Orange, N.J., assignor to Celanese Corporation, New York, N.Y.

No Drawing. Filed Oct. 7, 1968, Ser. No. 765,639
Int. Cl. B29c *25/00*; D01d *5/12*
U.S. Cl. 264—210 9 Claims

Strong shaped articles containing a cellulose ester blended with a synthetic reinforcement polymer can be prepared by drawing in an organic fluid selectively absorbed by said cellulose ester.

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3,600,494

## SEROLOGICAL TEST FOR SYPHILIS

Takayuki Tomizawa and Koichiro Fujita, Tokyo, Japan, assignors to Fujizokiseiyaku Kabushikikaisha, Tokyo, Japan

No Drawing. Filed Nov. 6, 1967, Ser. No. 680,979
Int. Cl. G01n *31/02, 33/16*
U.S. Cl. 424—13 2 Claims

A serological test for syphilis based on a carrier agglutination reaction is disclosed. The test includes the treatment of the serum test sample with a solution containing non-pathogenic strains of *Treponema pallidum* cell components and normal rabbits' testes components to absorb heterogenic antibodies. The treated serum sample is then reacted with a new antigen preparation comprising a suspension of *Treponema pallidum* sensitized carriers in a phosphate buffered saline solution.

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3,600,495

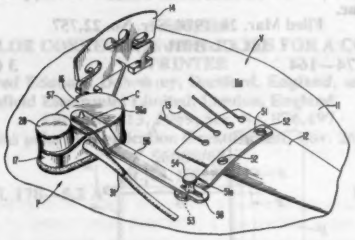
## MEDICAMENT PREPARATION AND PROCESS FOR THE MANUFACTURE THEREOF

George W. Oertel, Mainz, Germany, and Kurt Munzel, Riehen, Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

No Drawing. Filed July 15, 1968, Ser. No. 744,675
Claims priority, application Switzerland, July 28, 1967, 10,755/67
Int. Cl. A61k *17/00*
U.S. Cl. 424—31 8 Claims

Hormonal imbalance can be favorably influenced by the oral administration of sulpho-conjugated neutral steroids in gastric-juice-resistant form.

**3,600,496**
**ELECTROMAGNETIC PICKUP FOR A STRINGED MUSICAL INSTRUMENT**
**Joe D. Ellis, 1850 Christian Road, Charleston, S.C.**
**Filed Sept. 5, 1969, Ser. No. 855,484**
**Int. Cl. G10h** *3/00*
**U.S. Cl. 84—1.15** **5 Claims**



A device for sensing the vibrations of a stringed, musical instrument which includes an electromagnet having a diaphragm carrying a needle. The electromagnet being supported on the instrument isolated vibrationwise from the instrument body with the outer end of the needle engageable with the instrument bridge so that the device senses and amplifies the vibrations of the bridge during the playing of the instrument.

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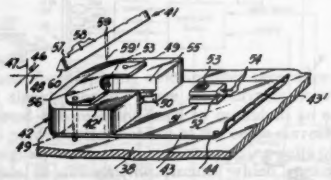
**3,600,497**
**ELECTROMECHANICAL TRANSDUCER PICK-UP BRIDGES FOR STRINGED MUSICAL INSTRUMENTS**
**Arrigo Zanessi, 215 Montevideo St., Mendoza, Argentina**
**Continuation-in-part of application Ser. No. 608,148, Jan. 9, 1967, now abandoned. This application Nov. 20, 1969, Ser. No. 878,335**
Claims priority, application Great Britain, Jan. 13, 1966, 1727/66
**Int. Cl. G10h** *3/00*
**U.S. Cl. 84—1.14** **4 Claims**



A piezoelectric pickup bridge for capturing the vibrations of a stringed musical instrument and comprising two parts separated by a resilient pad, the upper part carrying an adjustable screw that transmits vibrations to a transducer. A tone and volume compensating circuit for a sound amplifier connected to said transducer and comprising resistances and capacitances for selectively boosting or attenuating high or low frequencies and simultaneously maintaining substantially constant the overall gain of the system.

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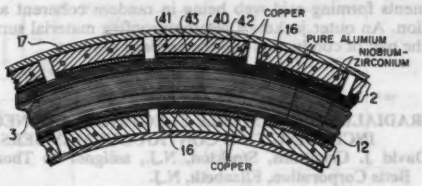
**3,600,498**
**SUPERCONDUCTIVE CABLE FOR CARRYING EITHER ALTERNATING OR DIRECT CURRENT**
**Marcel Aupoix, Paris; Francois Moisson-Franckhauser, Bretigny-sur-Orge, and Jean Royet, Orsay, all of, France, assignors to Campagnie General D'Electricite**
**Filed Dec. 24, 1969, Ser. No. 887,848**
**Claims priority, application France, Dec. 26, 1968, 180,800**
**Int. Cl. H01b** *7/34, 5/00*
**U.S. Cl. 174—15** **4 Claims**

A cable for cryogenic connection having one or more pairs of conductive layers insulated electrically from each other and consisting of several super-conductors arranged in spiral




formation over the opposing surfaces of the conductive layers.

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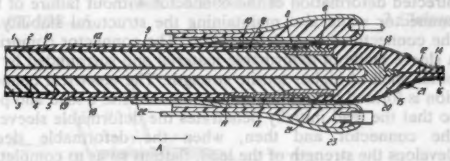
**3,600,499**
**JOINT BETWEEN A SUBMARINE COAXIAL ELECTRICAL CABLE AND A REPEATER TAIL CABLE AND METHOD OF MAKING SAME**
**David Arthur Hibbs, Chandlers Ford, England, assignor to International Standard Electric Corporation, New York, N.Y.**
**Filed Mar. 27, 1970, Ser. No. 23,134**
**Claims priority, application Great Britain, Apr. 2, 1969, 17,320/69**
**Int. Cl. H02g** *15/14*
**U.S. Cl. 174—70 S** **5 Claims**



An end of a submarine coaxial cable is joined to an end of a repeater tail coaxial cable by replacing the free end of the aluminum outer conductor of the submarine coaxial cable with an aluminum alloy braid sheath, welding the sheath to the aluminum outer conductor, and fitting a composite water barrier assembly into the inner insulation at the free end of the submarine cable. The assembly comprises a copper alloy castellated sleeve, an aluminum alloy end piece friction welded to the castellated sleeve, and a high strength copper alloy liner. The aluminum alloy end piece is welded to the braided sheath, and the castellated sleeve is joined to the copper braid of the outer conductor of the repeater coaxial tail cable.

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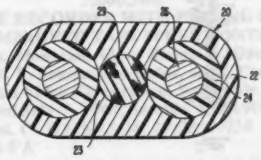
**3,600,500**
**TWIN CONDUCTOR WITH FILLER**
**Roger J. Schoerner; Bobby C. Gentry, and Bobby A. Rowland, all of Carrollton, Ga., assignors to Southwire Company, Carrollton, Ga.**
**Filed June 2, 1969, Ser. No. 829,377**
**Int. Cl. H01b** *7/00, 7/28*
**U.S. Cl. 174—115** **8 Claims**




A conductor assembly of improved physical properties including high tensile strength, crush force resistance and fungi resistance is prepared with at least two individually insulated

conductors such as round wires and a cordage product comprising a continuous coherent fibrous article of substantially cylindrical configuration produced from an oriented film composed essentially of a polymeric material, said article being a longitudinally fibrillated fibrous web, the fibroid segments forming said web being in random coherent association. An outer jacket of weatherproofing material surrounds the pair of conductors and the cordage product.

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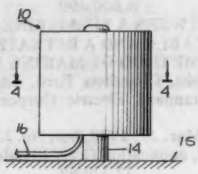
**3,600,501**
**RADIALLY DEFORMABLE ELECTRICAL CONNECTOR INCLUDING TWO CONTIGUOUS MEMBERS**

**David J. Crimmins, Stockton, N.J., assignor to Thomas & Betts Corporation, Elizabeth, N.J.**

Filed June 10, 1969, Ser. No. 831,912
Int. Cl. H02g *15/08*
U.S. Cl. 174—94 R 4 Claims




The deformable electrical connector is made in part of a material which has the property which permits outwardly directed deformation of the connector without failure of the connector while also maintaining the structural stability of the connector during deformation. The connector comprises a sleeve made of deformable material and surrounded by an outer shell of higher tensile strength. The electrical connection is formed by pushing the connector onto a lead and post so that the lead initially penetrates the deformable sleeve of the connector and then, when the deformable sleeve develops the strength of the lead, flattens so as to completely fill the space between the connector and post.

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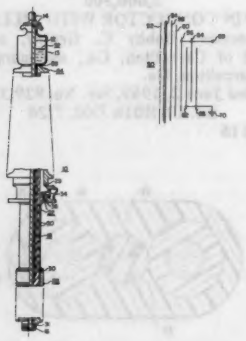
**3,600,502**
**ELECTRICAL CONDENSER BUSHING HAVING A PLURALITY OF CYLINDRICAL, INTERLEAVED, GROUND AND TAP LAYERS**

**Loren B. Wagenaar, Muncie, Ind., and Elmer J. Grimmer, Sharpsville, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.**

Filed Nov. 26, 1969, Ser. No. 880,228
Int. Cl. H01b *17/28*
U.S. Cl. 174—143 9 Claims



A condenser bushing including a conductor stud, insulating means disposed about the stud, and a plurality of radially spaced cylindrical layers of electrically conductive material disposed in the insulating means. The layers of electrically conductive material include interleaved ground and tap layers, to increase the total capacitance between tap and ground layers, and a voltage terminal connected to the tap layers.

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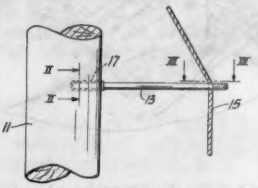
**3,600,503**
**DOWNLEAD INSULATOR**

**Moses W. Gaylord, Pittsburgh, Pa., assignor to Koppers Company, Inc.**

Filed Mar. 26, 1970, Ser. No. 22,757
Int. Cl. H01b *17/16*
U.S. Cl. 174—164 3 Claims




A downlead insulator for supporting pole line hardware has a hollow tubular cross section and is made of fiberglass reinforced resin. A plastic sleeve on one end fits into a hole in the pole and the downlead or grounding wire coacts with and is secured to the other end of the downlead insulator.

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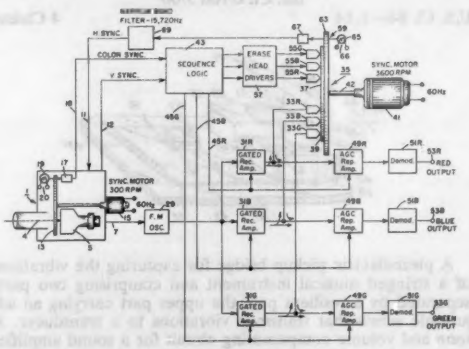
**3,600,504**
**FIELD SEQUENTIAL TO SIMULTANEOUS COLOR SIGNAL CONVERTER**

**Edward J. Reilly, Mayfield Heights, Ohio, assignor to Clevite Corporation**

Filed Jan. 26, 1970, Ser. No. 5,797
Int. Cl. H04n *9/42*
U.S. Cl. 178—5.2 R 9 Claims




An endless track multitrack magnetic recorder-reproducer is employed as a sequential to simultaneous color TV signal converter. The scan of the television system and the displacement of the record medium of the recorder are synchronized so that the field scan rate and the repetition rate of the recorder are equal. The sequential color signal modulates a carrier which is switched sequentially to a record-reproduce head at each track in synchronism with the sequential change in color information. Thus each track periodically receives a new recording of signals corresponding to the color assigned to that track. A separate playback circuit including a demodulator is connected to each record-reproduce head. Each circuit delivers continuous signals corresponding to the color assigned to its track, first during recording and subsequently during playback until a new recording takes place. Each playback circuit includes means for attenuating the

signal from the record amplifier, to which it is connected, during the time that recording is taking place at that head. Synchronization is simplified for closed circuit applications by driving the recorder-reproducer by a synchronous motor powered from the local AC power line, and generating horizontal sync signals for the TV system at the recorder-reproducer. A preferred form of sync generator is a light chopper mechanically coupled to the record medium.

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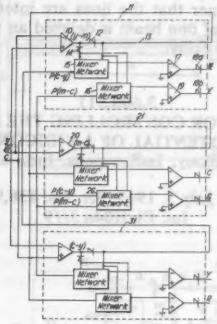
**3,600,505**
**COLOR CORRECTION APPARATUS FOR A COLOR PRINTER**

**Mouayed Edouard Dob[illegible]ey, Dartford, England, assignor to Crosfield Electronics Limited, London, England**

**Filed Nov. 13, 1969, Ser. No. 876,497**
**Claims priority, application Great Britain, Nov. 26, 1968, 56088/68**
**Int. Cl. H04n *9/53***
**U.S. Cl. 178—5.2 A** **10 Claims**



In apparatus for preparing color printer separation, color-component signals derived from an analyzing scanner are color-corrected before being used to modulate an exposing scanner. To permit better control of the color correction, the correction signals are derived by first applying pairs of uncorrected signals to differencing circuits which generate, for each pair, separate difference signals for differences of opposite polarities. Correction signals representing different restricted color ranges are then formed by adding, for each such restricted color range, an appropriate selection of the difference signals with suitable weighting and passing the resultant only if its polarity is such that an increase in its value corresponds to an increase in the color density of that restricted color range in the original. Finally, each uncorrected color-component signal is corrected with at least one of these correction signals.

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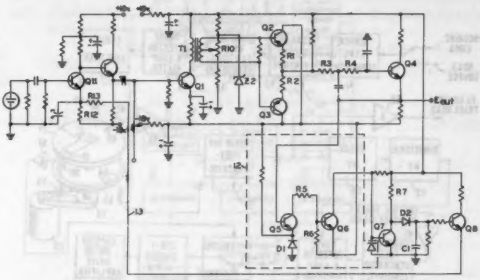
**3,600,506**
**BACKGROUND SENSING AND BLACK LEVEL SETTING CIRCUIT**

**William E. Richeson, Jr., Fort Wayne, Ind., assignor to The Magnavox Company, Fort Wayne, Ind.**

**Filed Mar. 3, 1969, Ser. No. 803,609**
**Int. Cl. H04n *3/12***
**U.S. Cl. 178—6 R** **10 Claims**

A background sensing and black level setting circuit for a facsimile transmission system is disclosed which linearly "stretches" the particular gray scale input of a document to yield an output having complete black to white gray scale characteristics. The circuit decreases its own gain rapidly when the lightest part of a document (exceeding some threshold) is scanned but increases its gain much more slowly when scanning darker areas so as to maintain its output for a



document background as white. The circuit also serves to fix the darkest area of the document scanned as being black.

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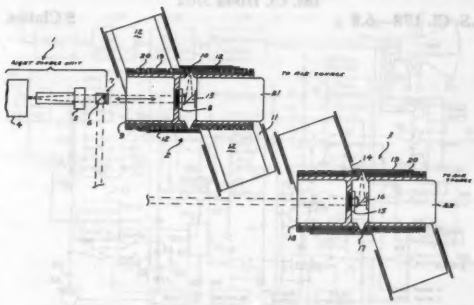
**3,600,507**
**HIGH DATA RATE OPTICAL COMMUNICATION SYSTEM**

**Peter M. Newgard, Redwood City, and Alfred E. Brain, El Granada, both of, Calif., assignors to The United States of America as represented by the Secretary of the Air Force**

**Filed June 11, 1969, Ser. No. 832,113**
**Int. Cl. H04n *1/06***
**U.S. Cl. 178—6** **3 Claims**



A high data rate optical communication system in which a high speed mechanical scanner directs a converging laser light beam through an intelligence containing film which is reflected back through the film by a mirror surface positioned on the immediate exterior of the film. The beam is modulated by twice passing it through the film and is directed back to the scanner for transmission to a receiver where the transmitted beam will recreate the transmitted information on an unexposed film at the receiver.

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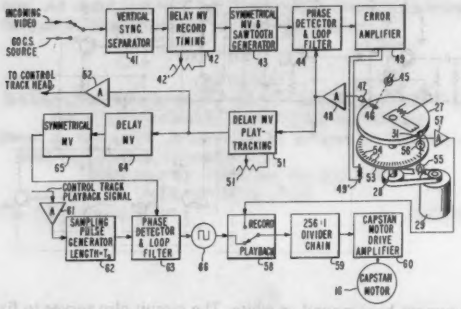
**3,600,508**
**VIDEO TAPE RECORDER WITH EDITING FEATURE AND IMPROVED TAPE SPEED CONTROL**

**Albert H. Dann, Mountain View; Robert L. Davis, San Jose, and Eugene R. P. Leman, Los Gatos, all of, Calif., assignors to International Video Corporation, Sunnyvale, Calif.**

**Filed July 7, 1969, Ser. No. 839,190**
**Int. Cl. G11b *15/28, 19/28, 27/28***
**U.S. Cl. 178—6.6 A** **17 Claims**

A video tape recorder having a servocontrol of the video head drive and another servocontrol of the capstan tape drive is described. In record, the capstan tape drive is controlled by tachometer pulses from the video head drive and during playback the capstan tape drive is switched over to control by control pulses from the magnetic tape. The tachometer pulses and the control track pulses are multiplied

by a substantial amount to reduce the degree that they may be out-of-phase with each other to thereby reduce the effect




on capstan speed when switching from control by the control pulses to control by the tachometer.

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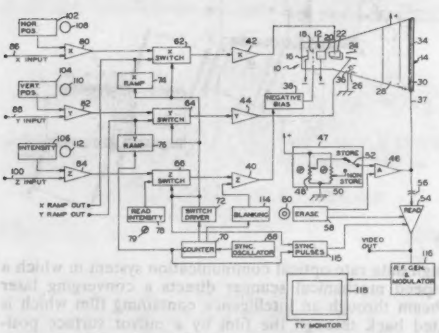
**3,600,509**

## CATHODE-RAY STORAGE TUBE AND MONITOR SYSTEM HAVING CONTROLLED IMAGE PERSISTENCE IN NONSTORE MODE

**Charles B. Gibson, Jr., Portland, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.**

**Filed Dec. 6, 1968, Ser. No. 781,759**
**Int. Cl. H04n** *5/02*
**U.S. Cl. 178—6.8** **5 Claims**



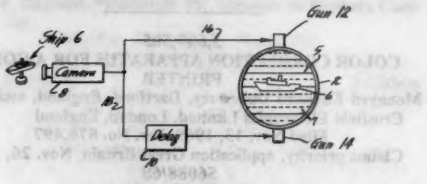

A system is shown for monitoring a direct viewing bistable image storage cathode-ray tube with a cathode-ray monitor tube in which the monitor tube visually displays stored writing when the storage tube is operated in its storage mode and nonstored writing when the tube is operated in a nonstore mode. The nonstored writing is displayed on the screen of the monitor tube with improved intensity and in a manner which insures that the complete image visible on the phosphor of the storage tube is reproduced on the screen of the monitor tube. This is accomplished by providing a circuit which maintains both a readout raster on the storage dielectric of the storage tube target and electron flood guns in operation while at the same time maintaining a potential on the target backplate below that necessary for the storing operation but at a value which causes the nonstored writing to have a controlled persistence lasting for at least the time duration of one frame of the readout raster.

**3,600,510**

## CLOSE VIEWING TV FOR SIMULATORS

**Joseph R. Owen, Orlando, and John J. Kulik, Winter Park, both of, Fla., assignors to The United States of America as represented by the Secretary of the Navy**

**Filed July 1, 1969, Ser. No. 838,128**
**Int. Cl. H04n** *7/18*
**U.S. Cl. 178—6.8** **1 Claim**




The number of lines in a television raster is increased to remove a raster visible on a television tube screen at close viewing distances without a concomitant increase in complexity of apparatus. One gun of a two-gun cathode-ray display tube receives a video signal. The second gun receives the video signal delayed. The scanning lines generated by the two guns on the display screen are controlled by sweep voltages in such manner that the lines are interleaved and the horizontal sweep of one beam is delayed an amount proportional to the video delay.

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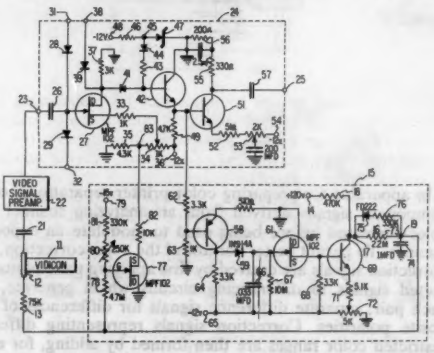
**3,600,511**

## APPARATUS FOR CONTROLLING THE OPERATING POTENTIAL OF A VIDICON

**John Andrew Cooksey, Indianapolis, Ind., assignor to RCA Corporation**

**Filed July 3, 1969, Ser. No. 838,988**
**Int. Cl. H04n** *5/19*
**U.S. Cl. 178—7.2** **8 Claims**




The video signal derived from a vidicon target electrode, after preamplification, is applied to the control gate input electrode of a field effect transistor where it is clamped by a pair of diodes and where combined horizontal and vertical blanking pulses are added to it by another diode at the transistor drain electrode and a pedestal component derived from a pedestal control circuit is added at the transistor source electrode to produce a clamped composite signal. The composite signal is clipped at a fixed level by a series diode coupled between the drain electrode of the field effect transistor and the base electrode of an emitter follower transistor, the emitter electrode being coupled to an output amplifier and to the input transistor of a peak detector including a diode and a second field effect transistor, the source output electrode of which is coupled to a transistor which supplies the operating potential for the vidicon target electrode through a coupling circuit comprising a capacitor and having a first branch including a relatively small value resistor and a diode which is forward biased for operating

potential decreases, thereby forming with the capacitor a short time constant, fast reacting circuit; the coupling circuit having a second branch including a relatively large value resistor which forms with the capacitor a long time constant, slow recovery circuit for operating potential increases which reverse bias the diode. The vidicon target electrode operating potential also is applied to the input gate electrode of a third field effect transistor having an output source electrode which is coupled to the pedestal control circuit.

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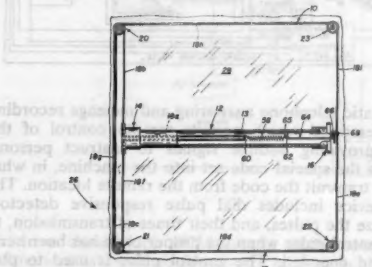
### 3,600,512
### APPARATUS FOR CORRELATING DIFFERENT PORTIONS OF A PROJECTED IMAGE AND METHOD OF ASSEMBLY THEREFOR

**Bruce E. Crayton, 400 Plymouth Ave., Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.**

**Filed Dec. 11, 1968, Ser. No. 782,961**
**Int. Cl. A43l** *13/02;* **H01j** *29/89*
**U.S. Cl. 178—7.85** **15 Claims**



This disclosure relates to apparatus for correlating different portions of an image displayed upon a screen and to a method of assembling the apparatus. Illustratively, the apparatus includes a correlating or indexing member which is suspended upon a flexible strand to allow the correlating member to be moved across the screen, and a plurality of guide points about which the strand is disposed. The guide points are located with respect to the display screen to permit the indexing member to be moved across a substantial portion of the display screen. The indexing member has an opening therethrough in which there is disposed spring means to interconnect a first portion of the flexible strand to a second portion of the flexible strand and also to place a predetermined tension upon the flexible strand.

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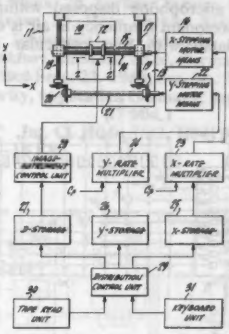
### 3,600,513
### PROCESS FOR RAPID RECORDING OF POLYGONAL IMAGES

**Charles R. Pendred, Pennsauken, N.J., and Stephen Marrs Petty, Albuquerque, N. Mex., assignors to RCA Corporation**

**Filed July 5, 1968, Ser. No. 742,563**
**Int. Cl. G08c** *21/00;* **H04l** *21/04*
**U.S. Cl. 178—15** **2 Claims**

A process for recording a solid polygonal image on an imaging medium. An artwork tool or apparatus illustrated as an automatic drafting system with an imaging instrument shown as a photoexposure head is employed. The photoexposure head is capable of recording images of different shapes and widths. According to the process, an image of the polygon is formed on the imaging medium by recording a number of smaller adjacent polygonal images which integrally form the image of the overall polygon. The polygon to be recorded is partitioned into a number of integral parts. The time required by the artwork tool to form the image is reduced by selecting the integral parts as rectangles whenever practical so that major portions of the polygonal image



can be formed with the widest available images which will fit within a particular rectangle.

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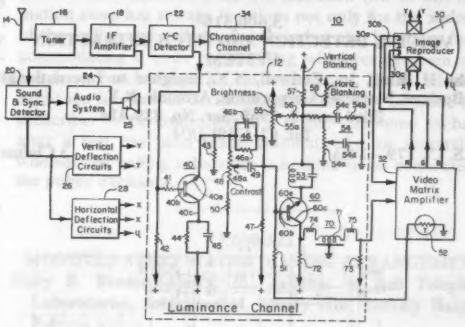
### 3,600,514
### SOLID-STATE LUMINANCE CHANNEL FOR COLOR TELEVISION RECEIVER

**Dwight J. Poppy, Chicago, Ill., assignor to Zenith Radio Corporation, Chicago, Ill.**

**Filed Mar. 9, 1970, Ser. No. 17,549**
**Int. Cl. H04n** *9/00, 5/14*
**U.S. Cl. 178—5.4 R** **6 Claims**




An improved solid-state luminance channel for a color television receiver having a plurality of interconnected transistor amplifiers wherein contrast and brightness controls are located in respective emitter electrode circuits so that the level of direct current components of the luminance signal remains substantially unaffected with selective settings of such controls. A time delay network is further included having both resistive and reactive termination to enhance the frequency response thereof, particularly at high frequencies. The resistive termination elements for the time delay means effectively serve as the load impedance for the associated transistor amplifier stage.

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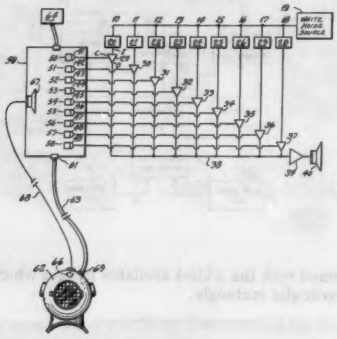
### 3,600,515
### APPARATUS FOR RECONSTRUCTING SPEECH GENERATED IN AN ABNORMAL GAS ATMOSPHERE

**Willard D. Carpenter, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy**

**Filed Mar. 9, 1970, Ser. No. 17,407**
**Int. Cl. G10l** *1/00*
**U.S. Cl. 179—1 SA** **6 Claims**

The reconstruction of distorted speech due to an abnormal breathing atmosphere is accomplished by providing a series

of separate channels each supplied with a white noise signal and having therein a narrow band filter and an amplitude controllable amplifier. The control input of each amplifier is connected to a microphone disposed within a Helmholtz resonator whose resonant frequency in air is equal to that of the filter associated with that particular amplifier. The



resonators are disposed in an atmosphere identical to that of the person whose speech is to be reconstructed or proximate the speaker and are subjected to the distorted acoustic speech. The outputs of the amplifiers are simultaneously applied to an output amplifier which in turn drives a transducer such as a loudspeaker to provide a corrected speech pattern.

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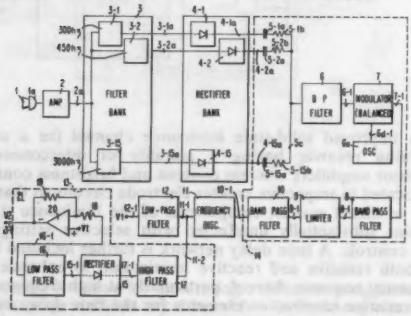
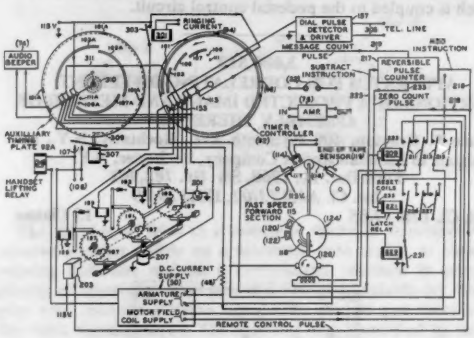
**3,600,516**
**VOICING DETECTION AND PITCH EXTRACTION SYSTEM**
**John H. King, Jr., Endwell, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.**
**Filed June 2, 1969, Ser. No. 829,414**
**Int. Cl. G10l** *1/04*
**U.S. Cl. 179—1 SA** **3 Claims**



Voicing detection and pitch extraction from speech sounds are achieved by means of an embodiment including a plurality of band-pass filters each having sufficient passing bandwidth to pass at least two harmonics of the fundamental voice frequency, whereby each provides a signal for all voiced sounds in the form of modulated waves, the envelopes of which having a periodicity equal to the voice fundamental. This periodicity is further enhanced by means of a hard limiter. A frequency discriminator whose input is provided by the band-pass filtered output of the limiter provides a voltage waveform whose special energy distribution is utilized for discrimination between voiced and unvoiced sounds.

**3,600,517**
**DIAL PULSE DECODERS**
**David M. Goodman, 3843 Debra Court, Seaford, N.Y.**
**Division of Ser. No. 256,883, Feb. 7, 1963, Pat. No. 383,469.**
**Filed May 6, 1968, Ser. No. 726,665**
**Int. Cl. H04m** *11/10*
**U.S. Cl. 179—5.5** **10 Claims**



An automatic telephone answering and message recording device is described which permits remote control of the device by providing audible signals to instruct persons, familiar with the spacial code set into the machine, in what sequence to transmit the code from the remote location. The decoding device includes dial pulse responsive detectors which analyze the pulses, and their times of transmission, to provide a control pulse when the proper code has been sent, received, and decoded. The control pulse is used to play back recorded messages, to erase the recorded messages, and to change the announcement message. In one embodiment the dial pulse detectors comprise a plurality of counting wheels with a plurality of holes therein which, when interrogated by a light beam, generates the control signal if the holes in the counting wheels are in alignment.

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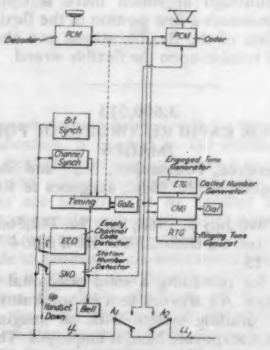
**3,600,518**
**SUBSCRIBER SUBSET FOR PCM TELEPHONE SYSTEM**
**Joseph H. McNeilly, Harlow Essex, and Roger A. Manship, Stortford, both of, England, assignors to International Standard Electric Corp., New York, N.Y.**
**Filed May 21, 1969, Ser. No. 826,316**
**Claims priority, application Great Britain, May 23, 1968, 24,694/68**
**Int. Cl. H04j** *3/08*
**U.S. Cl. 179—15 AL** **6 Claims**



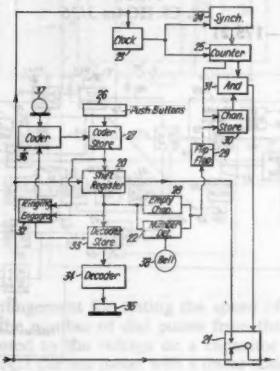
In a pulse code modulated telephone system subscriber sets are connected in series and each subscriber is responsive to its own unique call numbers in any time slot. Each called subscriber returns a modified signal in the same time slot to indicate the call has been received.

3,600,519

## SUBSCRIBER SUBSET FOR PCM TELEPHONE SYSTEM

Joseph Hood McNeilly, Harlow, Essex, and Roger Alan Manship, Stortford, both of, England, assignors to International Standard Electric Corp., New York, N.Y.

Filed May 21, 1969, Ser. No. 826,369
Claims priority, application Great Britain, July 26, 1968, 35856/68
Int. Cl. H04j 3/08
U.S. Cl. 179—15 AL 5 Claims




In a closed loop PCM system each subscriber's subset functions as digital equipment for both speech and signalling. A speech coder used in the system does not go into operation until after the signalling setting up a call has been completed, consequently it is possible to use one store (shift register) for setting up the signalling codes and also as the counter forming part of the speech coder. The subset also uses a common shift register for all incoming and outgoing line signals.

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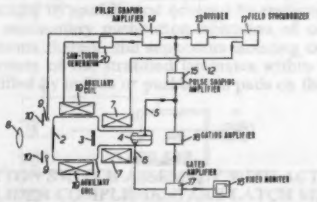
3,600,520

## LADENT IMAGE DISCHARGE FOR VIDEO CAMERA TUBE

Norman Arthur Slark, Essex, England, assignor to English Electric Valve Company Limited, London, England

Filed July 12, 1968, Ser. No. 744,351
Claims priority, application Great Britain, Aug. 4, 1967, 35,992/67
Int. Cl. H04n 5/26
U.S. Cl. 178—7.2 9 Claims



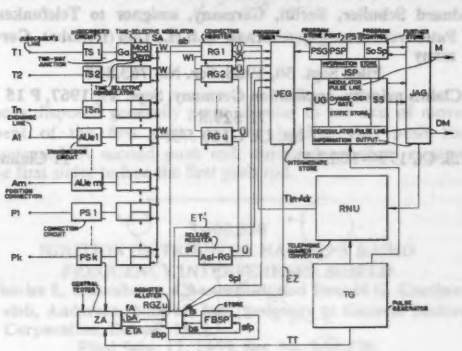

In a storage television camera tube, the photocathode is subjected to flood lighting during selected blanking intervals. A large amount of charge is thus produced on the screen and the screen is scanned to remove this charge so that only a negligibly small amount of charge remains. In this way optical images may be produced on the screen and read off in a short period, and a second image may be produced, without leaving a noticeable amount of charge on the cathode from the first image.

3,600,521

## TELEPHONE EXCHANGE ARRANGEMENTS WITH CENTRAL CONTROL

Karl-Ludwig Plank, 28, Berliner Strasse, Ober-Roden; Hans-Wilhelm Reher, 29, Hans Bockler Ring, Salzgitter-Lebenstedt, and Johannes-Georg Schosnig, 100 Hammarskjoldring, Frankfurt am Main, all of, Germany

Filed Sept. 23, 1968, Ser. No. 761,444
Claims priority, application Germany, Sept. 26, 1967, P 15 37 904.1
Int. Cl. H04q 3/42; H04j 3/00
U.S. Cl. 179—18 ER 15 Claims




An automatic telephone exchange arrangement is disclosed with central control and with a central information store, individual rows in which are associated with various possible simultaneous calls, wherein each row in this information store has storage locations not only for the addresses of the calling and called subscribers but also locations for accommodating a code representing whatever program stage has been reached by the call concerned. If the telephone exchange is a private exchange, provision may be made for a subscriber to be connected to a public telephone exchange after a test has been made automatically for ascertaining whether the calling subscriber is entitled to be connected to the public exchange.

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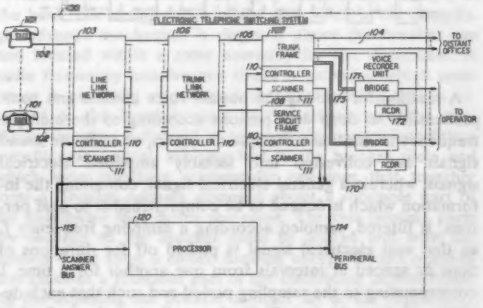
3,600,522

## MODIFIED ABBREVIATED DIALING ARRANGEMENT

Gary R. Benson, Itasca, Ill., assignor to Bell Telephone Laboratories, Incorporated, Murry Hill, Berkely Heights, N.J.

Filed Oct. 30, 1969, Ser. No. 872,584
Int. Cl. H04m 3/44, 3/38
U.S. Cl. 179—18 BA 18 Claims




In a telephone switching system employing abbreviated dialing, class of service information uniquely associated with

abbreviated dialing directory numbers, is stored in an abbreviated dialing repertoire. The switching system is responsive to the dialing of abbreviated codes by originating subscribers to establish telephone calls to stations defined by the directory numbers stored in an abbreviated dialing repertoire, and to assign a class of service to the established calls as prescribed by the class of service information associated with the called directory number.

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**3,600,523**

**REPRODUCTION PROCESS FOR MAGNETIC TAPES**

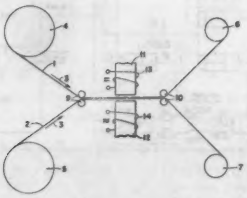
**Eduard Schuller, Berlin, Germany, assignor to Telefunken Patentverwertungsgesellschaft m.b.H., Ulm (Danube), Germany**

**Filed Sept. 30, 1968, Ser. No. 763,560**

**Claims priority, application Germany, Sept. 29, 1967, P 15 72 529.8**

**Int. Cl. G11b *5/86***

**U.S. Cl. 179—100.2 E** **11 Claims**



A contact reproduction process for magnetic tape recordings wherein information is first recorded on a tape, which forms the original, in the form of at least one strand of magnetizable material having cross-sectional variations provided therein. The original tape is then brought into contact with a blank tape and, subsequently, both tapes are exposed to a direct-current field and a high frequency field superimposed thereon. Since the original tape cannot be erased, it can be exposed to an optimum field intensity.

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**3,600,524**

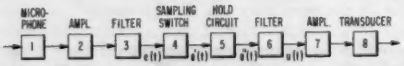
**HEARING AID USING MULTIPLE FREQUENCY TRANSLATION**

**Emanuele Biondi, and Leonardo Biondi, both of Milan, Via I, Nievo, 28/1, Milan, Italy**

**Continuation-in-part of application Ser. No. 718,506, Apr. 3, 1968. This application July 9, 1968, Ser. No. 743,460**

**Int. Cl. H04r *27/02, 25/00***

**U.S. Cl. 179—107 R** **3 Claims**




A method for making the human voice audible and comprehensible to deep deaf persons according to the multiple frequency translation technique or system, wherein the sound signals are converted into suitably amplified electrical signals, wherein a general electrical signal, containing the information which is desired to be comprehensible to deaf persons, is filtered, sampled according a sampling frequency $f_c$ so that said electrical signal is picked off for durations of time $\Delta t$ spaced at intervals from one another for a time T corresponding to the sampling period and such that each duration of time $\Delta t$ is sufficiently small that the individual picked off portions of the signal are considered to be of an approximately constant amplitude, but varying according to the values of said signal; the individual portions of the signal thus sampled are then delivered to at least one holding circuit causing them to continue for a period of time equal to T, and then subsequently filtered and converted to sound signals audible by deep deaf persons.

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**3,600,525**

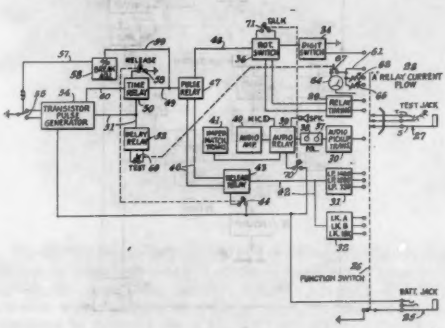
**TEST SET FOR STROWGER SWITCHES**

**Jim C. Garrett, and Robert H. Johnson, both of 5060 Salt Lake Avenue, Huntington Park, Calif.**

**Continuation of application Ser. No. 654,871, July 20, 1967, now abandoned. This application July 31, 1970, Ser. No. 64,132**

**Int. Cl. HO4m *3/26***

**U.S. Cl. 179—175.21** **5 Claims**




A test set particularly for equipment such as PBX, CDO and large telephone central offices, and comprising a hand-portable and compact boxlike, case-type unit in which is incorporated means to test timing and pulsing, Strowger two-motion switch "A" relay current flow, polarity across the lines, and amplified push-to-talk circuits of such equipment.

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**3,600,526**

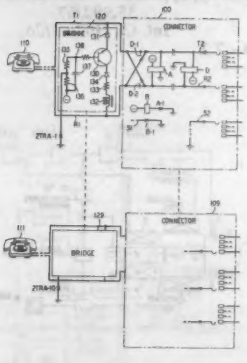
**TIMED INSERTION BRIDGE**

**Donald C. Pilkinton, Metuchen, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.**

**Filed Dec. 10, 1968, Ser. No. 782,622**

**Int. Cl. H04m *3/22***

**U.S. Cl. 179—175.2 C** **8 Claims**

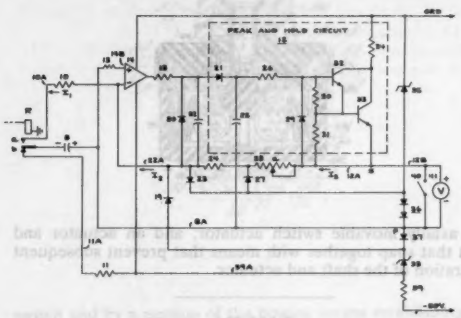



I disclose an arrangement for holding up a connection from the called end in a telephone switching system. Gradual insertion of holding bridges across the transmission paths of all switches serving a particular subscriber line eliminates acoustical disturbances. Responsive to a called subscriber signal, a bridge containing the emitter-collector path of a transistor is placed across the transmission paths by slowly biasing the transistor into conduction.

## 3,600,527
## DIAL SPEED TESTER

William H. Blashfield, Galion, Ohio, assignor to North Electric Company, Galion, Ohio

Filed Dec. 5, 1969, Ser. No. 882,455
Int. Cl. H04m *1/24*
U.S. Cl. 179—175.2 A 12 Claims




A circuit arrangement for testing the speed of telephone dials wherein the number of dial pulses from the telephone dial is represented by the voltage on a capacitor which can be read by a direct current meter with a linear scale.

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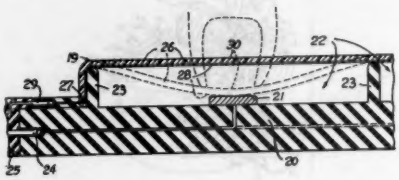
## 3,600,528
## MULTIPLE SWITCH CONSTRUCTION

Wayne V. Leposavic, Saratoga, Calif., assignor to Lematex Corporation, Cupertino, Calif.

Filed Sept. 25, 1969, Ser. No. 860,861
Int. Cl. H01h *9/26*
U.S. Cl. 200—5 17 Claims




Multiple switches produced as a flat panel embodying the basic principle of laminates of electrical conductors in desired patterns assembled as stratifications in close proximity but separated by spacers and covered by resilient material facilitating momentary pushbutton operation of companion switch elements thereof, the separators isolating companion switch elements of the stratified laminates within switching zones identified by indicia or pushbutton pads on the resilient cover.

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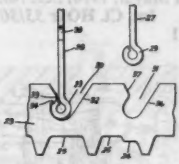
## 3,600,529
## PUSHBUTTON SWITCH ASSEMBLY WITH ACTUATOR AND SLIDER COMPLEMENTARY LATCH MEANS

Albert J. Gartland, Jr., Trumbull, Conn., assignor to General Electric Company

Filed Mar. 2, 1970, Ser. No. 15,381
Int. Cl. H01h *9/26*
U.S. Cl. 200—5 E 4 Claims

A pushbutton switch assembly includes a housing having a plurality of movable contacts and a plurality of elongated sliders. The sliders are reciprocably movable to selectively actuate the movable contacts. A plurality of push rods extend from the housing for longitudinal reciprocating movement relative to the housing. The inner ends of the push rods are received in actuating recesses in the sliders for selectively moving the sliders as selected push rods are depressed. A first push rod and its associated actuating recess in a first of the sliders have corresponding generally planar latching surfaces disposed generally perpendicular to the axis of movement of the first push rod for holding that push rod depressed. A second push rod, during depression, engages the first slider to free the first push rod.



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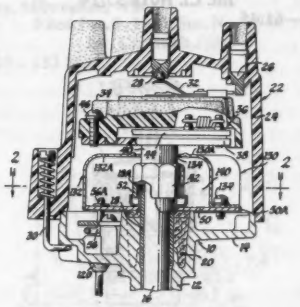
## 3,600,530
## IGNITION DISTRIBUTOR HAVING A RADIO FREQUENCY INTERFERENCE SHIELD

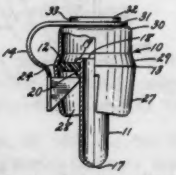
Charles L. Dusenberry, Chesterfield, and Donald G. Guethersloh, Anderson, both of, Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Sept. 17, 1969, Ser. No. 858,729
Int. Cl. H01h *19/00;* H02h *9/02*
U.S. Cl. 200—19 3 Claims



A radio frequency interference shield of an ignition distributor of the type having a fixed base and an adjustable breaker plate which is shifted by a vacuum unit relative to the base. The distributor is of the type wherein the centrifugal advance mechanism is disposed above the breaker can and located within a rotor assembly for the distributor. A radio frequency interference shield is provided which comprises a generally cup-shaped metallic housing that is attached to the breaker plate of the distributor. The cup-shaped housing is formed of two complementary interfitting metallic parts which are attached to the breaker plate and which have matching semicircular openings that together form a circular opening disposed about a rotatable part of the distributor that drives the rotor. The two housing parts are secured to the breaker plate by screws and with the breaker plate form a closed housing except for the opening that receives a rotatable part of the distributor and an opening for adjusting the breaker contact set of the distributor. The compartment defined by the breaker plate and the two housing shield parts enclose the distributor breaker contacts, a capacitor, and the capacitor lead wire connecting the capacitor to one of the breaker contacts.

**3,600,531**
**SELF-SHORTING PHONO PLUG**
**Otto Hoegerl, Saegertown, Pa., assignor to National Tel-Tronics Corporation, Yonkers, N.Y.**
Filed May 8, 1970, Ser. No. 35,830
Int. Cl. HO1r *33/30*
U.S. Cl. 200—51.1 2 Claims



A self-shorting plug for use in connection with a phonojack including a conventionally configured centrally disposed prong, a surrounding outer body member, and a flat steel shorting spring staked at one end thereof to the border of a centrally disposed opening in said outer body member, and having a free end terminal penetrating a slotted opening in a skirt portion of said outer body member to contact a surface of said prong.

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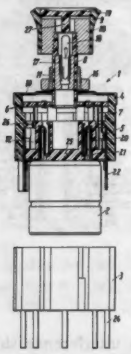
**3,600,532**
**AUTOMATIC EMERGENCY SWITCH TO ACTUATE AID SIGNAL FOR MOTOR VEHICLES**
**Wolfgang Priesemuth, Postkamp, Itzehoe, Holstein, Germany**
Filed July 9, 1969, Ser. No. 840,332
Int. Cl. H01h *35/14*
U.S. Cl. 200—61.45 4 Claims



A switch unit for use in connection with a flasher, which switch unit in addition to having a first set of stationary terminals also has a second set of weight loaded movable terminals which in response to the motor vehicle equipped with said switch unit being decelerated beyond the rate of deceleration normally occurring in motor vehicles during ordinary driving conditions will engage the first set of terminals and with the latter will close the circuit for the flasher.

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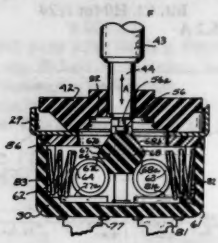
**3,600,533**
**ELECTRICAL SWITCH AND COMBINATION ELECTRICAL RESISTOR AND SWITCH**
**Jack A. English, Elkhart, Ind., assignor to CTS Corporation, Elkhart, Ind.**
Filed July 3, 1969, Ser. No. 838,755
Int. Cl. H01h *15/18*
U.S. Cl. 200—77 16 Claims

An actuator, coiled compression spring, and abutment surface or pair of stationary contact surfaces trap a contact roller. The spring shifts relative to the roller, assumes various contorted configurations, and whips the roller along actuator cam surfaces to stable roller positions. Also disclosed are means interlocking a shaft and switch actuator; a rotatable



and axially movable switch actuator; and an actuator and shaft that snap together with means that prevent subsequent separation of the shaft and actuator.

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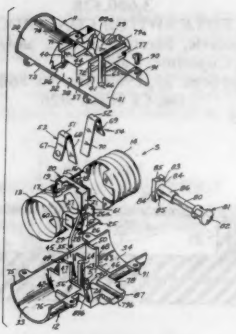
**3,600,534**
**ELECTRIC SOCKET SWITCH**
**David D. Lovitz, Short Hills, N.J., assignor to Sternco Industries, Inc., Harrison, N.J.**
Filed Aug. 21, 1970, Ser. No. 65,998
Int. Cl. H01r *19/50*
U.S. Cl. 200—51.17 11 Claims



An electric socket switch with a two-part casing having inner coacting holding means for holding contact components in position without the use of special fasteners. The two casing halves have interengageable transverse walls for clamping therebetween certain contact components, and also two oppositely extending posts for holding other contact components in place, upon an operative assembly of the two casing parts.

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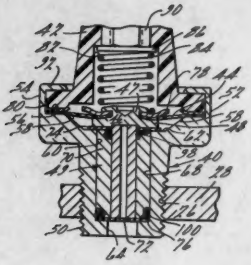
**3,600,535**
**FLUID PRESSURE ACTUATED ELECTRICAL SWITCH WITH ELECTROMAGNETIC BIASING MEANS FOR ESTABLISHING DIFFERENT PRESSURE LEVELS FOR ACTUATION AND DEACTUATION**
**Rudolph Bergsma, and Harry I. Baker, both of Ann Arbor, Mich., assignors to Chrysler Corporation, Highland Park, Mich.**
Filed Oct. 2, 1969, Ser. No. 863,108
Int. Cl. H01 *35/34*
U.S. Cl. 200—83 R 4 Claims

An electrical switch operable from a source of variable fluid pressure and settable from a first electrical condition to a second electrical condition when the applied pressure attains a first predetermined level and resettable from the second back to its first electrical condition when the applied pressure decreases to a second predetermined level. The

operating levels of the switch are determined by a compound biasing means establishing the first pressure level to set the switch and by a portion of the biasing means establishing the second pressure level to reset the switch.



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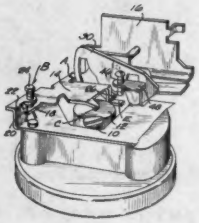
**3,600,536**
**CALIBRATING PRESSURE SWITCHES AT EXTRA LOW-PRESSURE SETTING**

**Erich Kothe, Schiller Park, Ill., assignor to Controls Company of America, Melrose Park, Ill.**

**Filed Dec. 22, 1969, Ser. No. 887,269**
**Int. Cl. H01n** *35/26, 35/34*
**U.S. Cl. 200—83 WM** **5 Claims**



The force or degree of compression of the spring is adjusted by rocking the lever about its axis A–B by means of the manually operated cam acting on the lever at D. Calibration for the low-to-high range is effected by adjusting the screw at B to rock the lever about axis A–D. For "extra low" settings, the cam is turned so the tab at D can, in effect be unlimited on its rise and the calibration is then effected by adjusting the limit screw acting on tab E. Any tool forces applied to either adjusting screw during calibration cannot be transmitted to the spring to adversely effect calibration.

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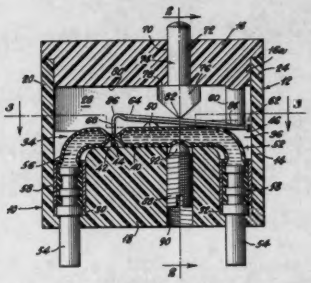
**3,600,537**
**SWITCH**

**Robert H. Twyford, Falls Church, Va., assignor to Mechanical Enterprises Incorporated**

**Filed Apr. 15, 1969, Ser. No. 816,322**
**Int. Cl. H01h** *29/00*
**U.S. Cl. 200—152** **6 Claims**

An electrical switch including a resilient deformable tube filled with an electrically conductive liquid and a pair of relatively movable pinching elements disposed on opposite sides of the tube. The elements are mounted for movement between tube pinching and tube releasing positions, whereby in the tube pinching position the liquid in the tube is parted to open an electrical circuit. The switch also includes a spring-loaded snap-action mechanism operably connected to at least one of the elements for snapping the same from one of its positions to the other.



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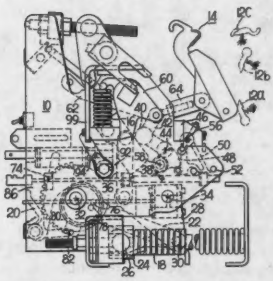
**3,600,538**
**CIRCUIT BREAKER ARRANGEMENT FOR PREVENTING SLOW CLOSING OF BREAKER CONTACTS**

**Vitold S. Puzas, Norwood, and John J. Abdou, Jr., Braintree, both of, Mass., assignors to Allis-Chalmers Manufacturing Company, Milwaukee, Wis.**

**Filed Jan. 9, 1970, Ser. No. 1,746**
**Int. Cl. H01h** *3/30*
**U.S. Cl. 200—153 SC** **1 Claim**



An electric circuit breaker having springs which discharge to close the circuit breaker contacts is provided with a motor to recharge the springs. A one-way ratchet device connected to the motor shaft prevents reverse motor rotation in the event of power loss to the motor due to spring discharge and thereby prevents the partially charged springs from discharging to cause slow closing of the contacts.

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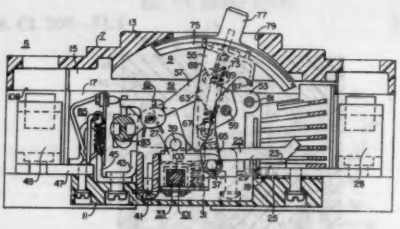
**3,600,539**
**MULTIPOLE CIRCUIT INTERRUPTER**

**Eugene J. Walker, and Donald G. Portman, both of Beaver, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.**

**Filed Sept. 17, 1969, Ser. No. 858,614**
**Int. Cl. H01h** *9/24*
**U.S. Cl. 200—153 G** **10 Claims**

A multipole circuit interrupter, having an elongated metal-

core tie bar supporting the plurality of movable contact arm structures, comprises improved means supporting the tie bar



for pivotal movement with insulating means preventing a phase-to-phase fault through the metal core.

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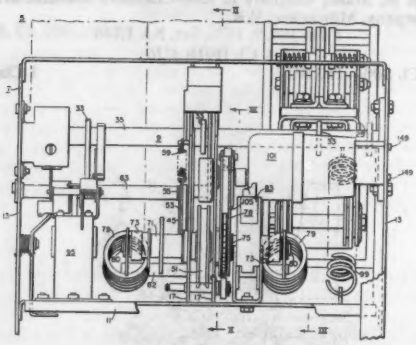
**3,600,540**
**MOTOR-OPERATED SPRING-CLOSING CIRCUIT BREAKER**

**Fred Bould, Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.**

**Filed Nov. 6, 1969, Ser. No. 874,648**
**Int. Cl. H01h** *3/00*
**U.S. Cl. 200—153** **5 Claims**



A circuit breaker comprises spring closing means and a motor drive structure for charging the spring-closing means with improved means supporting the motor drive structure in a cooperating relationship with the spring closing means.

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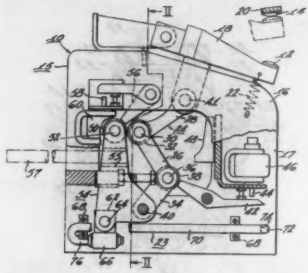
**3,600,541**
**CIRCUIT BREAKER OPERATING MECHANISM HAVING TORSION BAR SPRINGS**

**Edwin C. Goodwin, Jr., Canton, Mass., assignor to Allis-Chalmers Manufacturing Company, Milwaukee, Wis.**

**Filed Nov. 6, 1969, Ser. No. 874,460**
**Int. Cl. H01h** *3/00*
**U.S. Cl. 200—153** **14 Claims**

A circuit breaker operating mechanism comprises one or more supporting frame members on which a movable contact operating means, including a collapsible toggle linkage, is mounted. One or more torsion bars, each having a fixed end attached to a frame member and a rotatable working end, are mounted on the frame members. A pivotable member or crank on the frame members cooperates with the toggle linkage and the working end of the torsion bar. A manually operable handle or motor-driven cam moves the crank to a position wherein it allows the toggle linkage to assume its contact open position and wherein the crank charges the torsion bar. A releasable latching means holds the crank in such position until it is released, whereupon the torsion bar rotates



the crank which, in turn, moves the toggle linkage to contact closed position.

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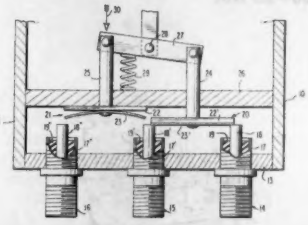
**3,600,542**
**VIBRATION-RESISTANT CONTACT STRUCTURE FOR COAXIAL SWITCH**

**Gunther M. Richter, Brookfield Center, Conn., assignor to The Bunker-Ramo Corporation, Oakbrook, Ill.**

**Filed Mar. 5, 1969, Ser. No. 804,458**
**Int. Cl. H01h** *1/24, 1/50*
**U.S. Cl. 200—166 H** **11 Claims**



A vibration-resistant contact structure including a movable contact for interconnecting two fixed contacts. The movable contact includes a rigid blade and a flexible blade. The flexible blade engages the fixed contacts when the movable contact is urged into partially closed connection. When fully closed, the flexible blade is deflected substantially flush up against the rigid blade. During vibration, the movable contact need not remain absolutely motionless but can move within the range established between the partially closed and fully closed positions and continuity is retained. In one embodiment, the flexible blade is secured to the rigid blade at a point between its ends. In another, the flexible blade is attached to one of the fixed contacts, and in still another the flexible blade is slidably mounted on the contact actuator. Use of contact structures of this type is illustrated in a coaxial switch including provision for make-before-break operation.

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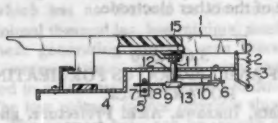
**3,600,543**
**KEYING SWITCH ASSEMBLY**

**Seiji Nakada, Hamamatsu-shi, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Nakazawa-cho, Shizuoka-ken, Japan**

**Filed Nov. 19, 1969, Ser. No. 878,061**
**Claims priority, application Japan, Nov. 21, 1968, 43/101650**
**Int. Cl. H01h** *1/50*
**U.S. Cl. 200—166 H** **9 Claims**

A keying switch assembly operable by means of a key includes a stationary contact member, an elastically bendable contact member having a fixed end and a movable end which is selectively operable to contact the stationary contact, and

a flexible shock absorber attached to the bendable contact member for reducing shock noises. An actuator strikes against the shock absorber upon operation of the key so as to



cause the bendable contact member to be silently bent, so that the movable end thereof contacts the stationary contact member.

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**3,600,544**

**CABLE SHEATH SEAM WELDING**

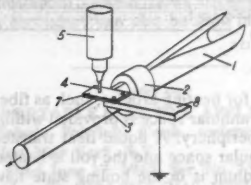
**Colin Francis Greening Smith, Hants, England, assignor to International Standard Electric Corporation, New York, N.Y.**

**Filed June 20, 1966, Ser. No. 558,900**

**Claims priority, application Great Britain, June 25, 1965, 26996/65**

**Int. Cl. B23k *9/02***

**U.S. Cl. 219—61** **4 Claims**



A seam-welding method for metal tubes displaces the welding electrode from a normal position with respect to the tube to a position over an auxiliary electrode. Current is initiated between the welding electrode and auxiliary electrode which is removed and the current increased, with the welding electrode being returned to the normal position.

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**3,600,545**

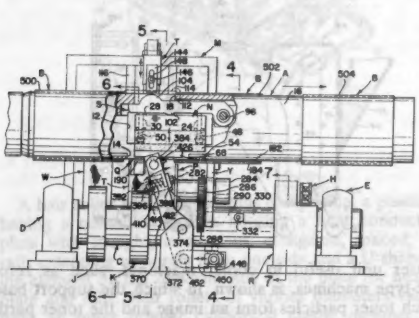
**ELECTRIC WELDER FOR CAN BODY SEAMS**

**Ronald Herman David Armbruster, Battle Creek, and Roger Jacob Nelsen, Hastings, both of, Mich., assignors to Gulf & Western Industrial Products Company, Grand Rapids, Mich.**

**Filed Sept. 3, 1968, Ser. No. 756,996**

**Int. Cl. B23k *1/16, 11/30***

**U.S. Cl. 219—64** **8 Claims**



A machine for making spot welds along the seam of a tubular can body includes an elongated cylindrical mandrel along which the can bodies are advanced. A reciprocating electrode is mounted in a cavity in the mandrel and selectively contacts the inside of a can seam. Another reciprocating electrode is mounted externally of the mandrel and contacts the outside seam of a can blank. The machine includes a rotatable shaft on which cams are mounted for selectively moving the inner and outer electrodes into engagement with the seam of a can blank. A special scraper is also cam operated to move along the surface of the inner electrode and scrape tin therefrom as the electrodes are moved apart.

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**3,600,546**

**ELECTRICAL DISCHARGE TREATMENT AND MACHINING APPARATUS**

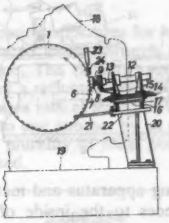
**Toshio Niwa, Osaka; Yasuo Kimoto, Osaka; Katsunori Tamiya, Kobe, and Hisashi Okamura, Osaka, all of, Japan, assignors to Hitachi Shipbuilding and Engineering Co. Ltd., Nishi-ku, Osaka, Japan**

**Filed Aug. 20, 1969, Ser. No. 851,556**

**Claims priority, application Japan, Aug. 23, 1968, Aug. 23, 1968, Aug. 23, 1968, Aug. 23, 1968, 43/60759, 43/60761, 43/60762, 43/60760**

**Int. Cl. B23p *1/08***

**U.S. Cl. 219—69 M** **7 Claims**



A method of electrical discharge machining employs a sugar mill roll as a cathode and an electrode for performing treatment serving as an anode. Water is injected therebetween and concurrently therewith repetitive transient arc discharges are effected, whereby the grooved surface of the roll is provided with satin finish. The electrode can be a turner or scraper plate which is machined with the roll serving as the tool electrode and subsequently employed with the roll as a mill.

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**3,600,547**

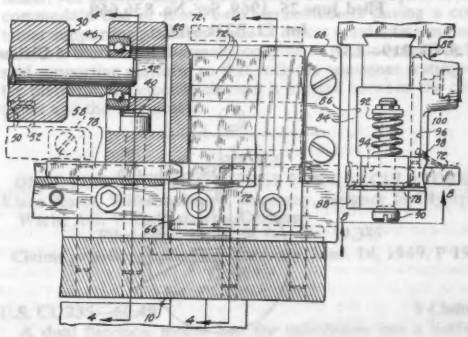
**AUTOMATIC MAGAZINE-TYPE ELECTRODE HOLDER FOR AN ELECTROSTATIC DISCHARGE MACHINING DEVICE**

**Philip L. Turner, Southfield, Mich., assignor to Ford Motor Company, Dearborn, Mich.**

**Filed Aug. 27, 1970, Ser. No. 67,443**

**Int. Cl. B23p *1/04, 1/08;* H05b *31/20***

**U.S. Cl. 219—69 E** **12 Claims**



An electrostatic discharge machining device comprising an automatic feeder for loading electrodes automatically and for successively advancing them to compensate for erosion in-

cluding an electrode holder for positioning the electrodes, a quill support adapted to receive the electrodes prior to a machining operation and an actuator for advancing the quill support toward the electric spark region during machining operations thereby maintaining a proper arc gap and an automatic cam mechanism for triggering the operation of the actuator in timed sequence with the advancing and retracting modes for the electrode quill support, the actuator and said cam mechanism being adapted to eject successively each electrode after it is eroded to a predetermined extent and for replacing it with a new electrode during subsequent advancement of the electrode quill support to its operating position.

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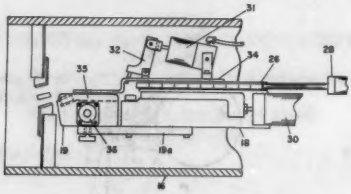
**3,600,548**

**RESISTANCE WELDING APPARATUS**

**John C. Bock, Madison, Wis., assignor to Bock Corporation, Madison, Wis.**

**Filed July 9, 1970, Ser. No. 53,530**
**Int. Cl. B23k 9/12**
**U.S. Cl. 219—79** **4 Claims**




Resistance welding apparatus and method for attaching a series of metal pieces to the inside of a metal tube in a predetermined pattern controlled by longitudinal and rotational indexing of the tube. An electrode arm extends into the tube and has an associated feed track along which the metal pieces are intermittently moved to a welding head on the end of the electrode arm. A piston carried by the welding head and acting against the inside of the wall of the tube moves the welding head transversely of the electrode arm to bring the piece to be welded into pressure contact with the inside of the tube. Current is run through the electrode arm, welding head, piece, tube and a grounded contact to weld the piece to the tube.

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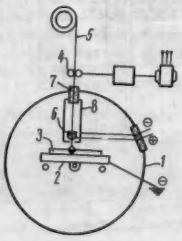
**3,600,549**

**METHOD OF THE ARC WELDING AND DEPOSITION OF METALS IN VACUUM**

**Nikolai Alexandrovich Olshansky, Pogonolosinoostrovskaya ulitsa 6, Kv. 2, Moscow, U.S.S.R., and Alexandra Vladimirovna Mordvintseva, deceased, late of Moscow, U.S.S.R. (Alexander Mordvintsev Leonide, administrator, Peospekt Mira, 112 kv. 163, Moscow, U.S.S.R.)**

**Filed June 25, 1969, Ser. No. 836,669**
**Int. Cl. B23k 9/10**
**U.S. Cl. 219—137** **4 Claims**




A method of the arc welding and deposition of metals in vacuum by means of a consumable electrode, in which for the purpose of providing the stable arcing process between the electrode wire and the workpiece, the arc is stabilized by shielding the current-carrying parts of one of the electrodes with the aid of a metal envelope having a charge corresponding to the charge of the other electrode.

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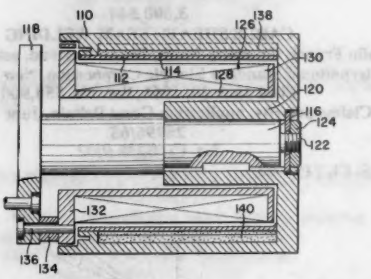
**3,600,550**

**METHOD OF AND APPARATUS FOR HEATING A ROTARY ROLL**

**Takuma Katsumata, Inazawa, Aichi Prefecture, and Tetsuo Ochi, Nagoya, Aichi Prefecture, both of, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan**

**Filed Sept. 11, 1969, Ser. No. 857,045**
**Int. Cl. H05b 5/00; B21b 27/06**
**U.S. Cl. 219—10.61** **11 Claims**




In a rotary roll for heating articles, such as fibers which are to be worked, an annular space is provided within the roll adjacent its outer periphery. A liquid heat transfer medium is placed in the annular space and the roll is heated so that the heat transfer medium is in the boiling state having a liquid phase and a vapor phase. As the roll is rotated centrifugal forces are developed which maintain the liquid phase of the medium against the outer surface defining the annular space. The structure of the roll defining the outer surface of the annular space can be a continuous smooth surface or an undulating surface providing alternate ridges and depressions for improving the effect of the heat transfer medium. The heat medium provides a uniform temperature distribution over the roll.

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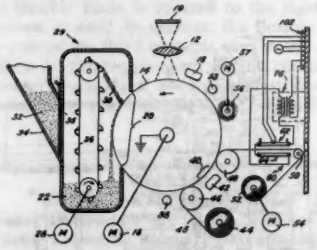
**3,600,551**

**FUSING APPARATUS**

**Charles D. Flanagan, Attleboro, Mass., assignor to Texas Instrument Incorporated, Dallas, Tex.**

**Filed Jan. 2, 1968, Ser. No. 694,914**
**Int. Cl. H05b 1/00**
**U.S. Cl. 219—216** **9 Claims**



A fuser unit useful in copier machines, such as zerographic-type machines, is shown, in which the support base on which toner particles form an image and the toner particles are heated to effect fusion of the particles and bonding of the fused toner to the support base. A conventional zerographic machine is shown which mounts therein the fuser unit comprising a low voltage source in the form of a high turns ratio transformer, a temperature controller, foil-heating

elements suspended in frames and a temperature sensor having first thermal response located on one of the foil elements. An alternating current source in the machine is used as the input to the system via the temperature controller. The foil heater, which has no thermal or electrical insulation, and hence minimal thermal lag, has minimal mass with substantial radiant heat generating surface area thereby permitting a very fast warmup time—within a copy cycle—so as to be maintained in a deenergized standby condition between copy cycles. The low voltage source obviates shock hazards in the machine. The support base can be moved at a constant rate of speed or intermittently if desired.

Another embodiment employs a rotating drum adapted to carry a support base, which has been subjected to a liquid development treatment, through a fuser unit. The drum may be heated if desired. A foil heater is mounted between two current distributing support electrodes, one electrode being fixed; the other, biased to tension the foil against the drum in intimate heat transfer relationship to the support base passing therebetween. As in the first embodiment a temperature controller, alternating current source and a temperature sensor having low mass are employed. The secondary is comprised of a large cross-sectional area bus bar whose ends are electrically joined to the foil through the current distributing electrodes and whose control section passes through the iron core of the transformer thereby providing a single turn secondary winding. The cross section of the bus bar is selected to minimize voltage drop and associated power loss with the substantial current flows necessary. This type of transformer secondary can also be used in the first embodiment.

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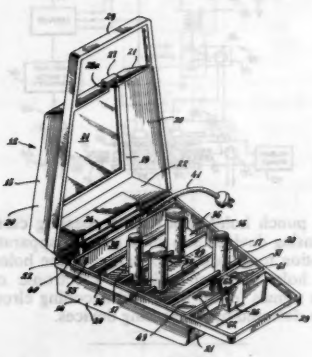
**3,600,552**

## PORTABLE ELECTRIC APPLIANCE

**Robert J. Tolmie, Fairfield, Conn., assignor to Sperry Rand Corporation, New York, N.Y.**

**Filed June 17, 1968, Ser. No. 737,467**
**Int. Cl. A45d *4/16, 2/10;* H05b *3/00***
**U.S. Cl. 219—222** **8 Claims**



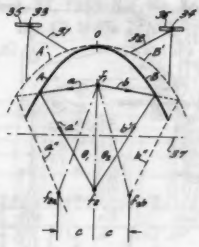
A hair roller heating apparatus comprising, a plastic casing having a container section housing a heat conductive flat plate with straight, continuous, elongated, spaced, parallel rails extending upwardly from one side and a U-shaped heating element on the opposite side of the plate for heating the plate and rails. Hair rollers of various diameters each comprise an outer tubular cylindrical plastic member and an inner tubular cylindrical aluminum member fitting within the outer member in heat transfer relation therewith. Each of the inner and outer members have diametric recesses which fit on the rails with the inner member in heat transfer relation with the rails.

**3,600,553**

## METHOD AND APPARATUS FOR HEATING A PLURALITY OF CLOSELY SPACED DISCRETE ZONES BY A SINGLE ENERGY SOURCE

**Bernard J. Costello, Ringoes, N.J., assignor to Argus Engineering Co., Inc., Hopewell, N.J.**

**Filed Sept. 16, 1969, Ser. No. 858,291**
**Int. Cl. H05b *1/00;* F24h *9/02***
**U.S. Cl. 219—348** **9 Claims**



Radiant energy heating apparatus for heating a plurality of discrete, closely spaced zones through the use of a single radiant energy source. The radiant energy is focused upon the discrete zones by a reflector assembly of elliptical shape which is split at its apex into at least two halves, which halves are rotated relative to one another by an amount sufficient to locate the resulting plurality of focal points coincident with the zones being heated.

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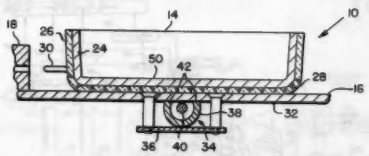
**3,600,554**

## COOKING APPLIANCE HAVING A THERMALLY SENSITIVE BASE

**Glenn R. Bange, Pittsford, N.Y., assignor to Sybron Corporation, Rochester, N.Y.**

**Filed Apr. 8, 1970, Ser. No. 26,630**
**Int. Cl. F27d *11/02***
**U.S. Cl. 219—432** **8 Claims**



A cooking appliance including a cooking container having an exterior glass coating and an electric heating element encapsulated in the glass coating along the bottom of the container. An electric supply and control console adapted to accommodate one or more cooking containers having a container supporting platform made of a heat conducting material with a thermostat thermally coupled to the undersurface of said supporting platform so that with the container resting on the platform, the electric element is located between the container and the thermostat.

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**3,600,555**

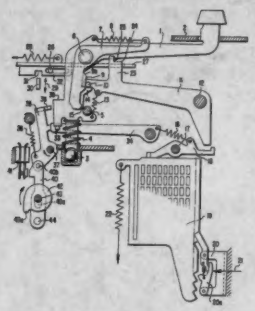
## DUAL FUNCTION MOTOR KEY FOR CALCULATORS

**Klaus Korte, Wilhelmshaven, Germany, assignor to Olympia Werke AG, Wilhelmshaven, Germany**

**Filed Mar. 13, 1970, Ser. No. 19,385**
**Claims priority, application Germany, Mar. 14, 1969, P 19 13 069.9**
**Int. Cl. G06c *21/02***
**U.S. Cl. 235—60.49** **7 Claims**

A dual function motor key for calculators has a setting mechanism, such as a pin carriage, having a home position and a value position and mounted for movement, from one position to the other. A key, such as a dividend input key, is mounted to be depressed and initiate an operating step, and a

latch is movably mounted on the key for a movement with it. A program control member is operatively connected to the setting mechanism to sense its position when the key is depressed; and is operatively connected to the latch to actuate the latch and hold the key in its depressed position until the operating step is concluded when the setting mechanism is in its value position. When the setting mechanism is in its



home position, the program control member does not actuate the latch and the key is permitted to move out of its depressed position during the operating step. In this manner, if a value is sensed in the setting mechanism, it is first fed into the appropriate register before the contents of that register are produced. If there is no value in the setting mechanism, the contents of the appropriate register are merely produced at once.

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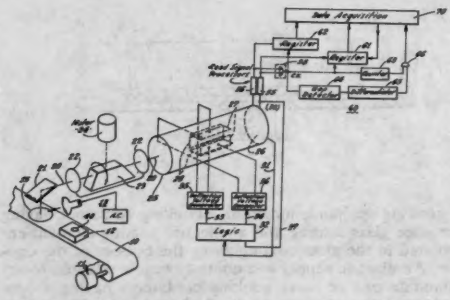
**3,600,556**
**APPARATUS FOR MACHINE READING RANDOMLY POSITIONED AND ORIENTED INFORMATION**

**Norbert K. Acker, Koenigstein, Germany, assignor to Scanner, Inc., Houston, Tex.**

**Filed Apr. 21, 1969, Ser. No. 817,680**
**Int. Cl. G06k** *7/00*
**U.S. Cl. 235—61.11 E** **47 Claims**



A device is disclosed in which an area through which data in a data field may pass, is imaged onto detectors of an image position detection device. The area image rotates and a data image therein is centered as soon as detected to rotate about its own center. Fine-position control maintains the rotating data in particular relation to readout detectors, scanning circular image tracks in the vicinity of at least one of the image position detectors.

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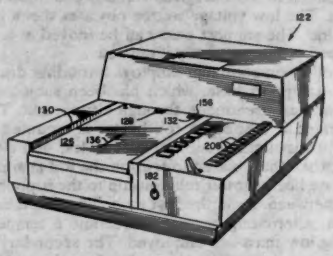
**3,600,557**
**DATA SCANNER**

**Joseph M. Zappia, Miami, Fla., assignor to Datatype Corporation, Miami, Fla.**

**Filed May 27, 1969, Ser. No. 828,238**
**Int. Cl. G06k** *7/10;* **G01n** *21/30*
**U.S. Cl. 235—61.11 E** **59 Claims**

A system for scanning transversely extending lines of data printed graphically on a document, the system comprising a transversely movable scanning head, means for moving a document longitudinally relative to the scanning head and control means including optical means for finding a line of data to be scanned and stopping such relative movement. The control means may also include switch means for stopping the drive means providing the relative longitudinal movement and a plurality of switch actuator means longitudinally spaced apart to define a plurality of preselected rela-



tive positions for the scanning head and such a document. The scanning head carries light source means for projecting light at the data, a light-responsive semiconductor device and optical means for projecting light reflected from such a document toward said device, whereby the concentration of light on said device depends on the presence or absence as well as the width and spacing of graphical symbols in the line of data being scanned.

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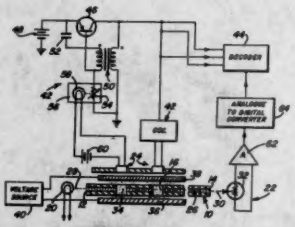
**3,600,558**
**CODED CARD AND READING MEANS**

**Gregory Grosbard, Long Beach, N.Y., assignor to International Research Development, Inc.**

**Filed Apr. 17, 1969, Ser. No. 822,850**
**Int. Cl. G06k** *7/10;* **G01n** *21/30*
**U.S. Cl. 235—61.11 E** **15 Claims**



The code punch holes in a data processing card are detected by sensing devices in a code reading apparatus to obtain information form both the location of the holes and the number of holes in each column. Electronic oscillators generate the signals fed to logic and decoding circuits when the holes are detected by the sensing devices.

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**3,600,559**
**DIVISION DEVICE FOR USE IN MOTOR OPERATED CALCULATORS**

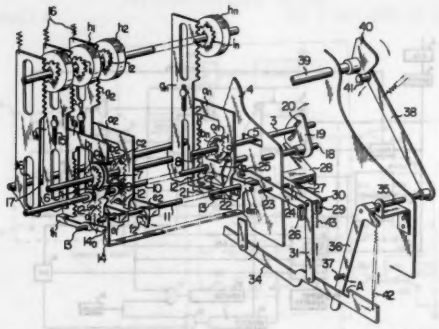
**Rii Watanabe, Tagata-gun, Shizuoka-ken, Japan, assignor to Tokyo Denki Kabushiki Kaisha, (also known as Tokyo Electric Co., Ltd.), Tokyo-To, Japan**

**Filed June 12, 1968, Ser. No. 736,474**
**Int. Cl. G06c** *23/00*
**U.S. Cl. 235—63 F** **7 Claims**

There is provided a rod actuating a device for changing-over the calculator from subtraction state to addition state, and when the dividend becomes negative after any subtraction has been completed, the calculator is automatically changed over to addition state and said rod is brought in connection with a main driving shaft only when a lever which operates in the case of a subtraction state and another lever which operates in the state where the dividend becomes negative are both operated, whereby it is made possible to

change over correctly the calculator from addition state to subtraction state and vice versa without causing reestablishment of the addition state when the calculator is once changed over to addition state.

Furthermore, a lever rotative in response to movement of a rack plate belonging to the uppermost figure and a complement-calculation lever engageable with a rack plate belonging to the first figure are provided, said former lever being engaged with said latter lever and operation of said latter lever being locked by a coupling member which operates in the case of division, whereby it is made possible to carry out division without calculating out any complement, because the complement-calculation lever is locked in the case of adding operation.



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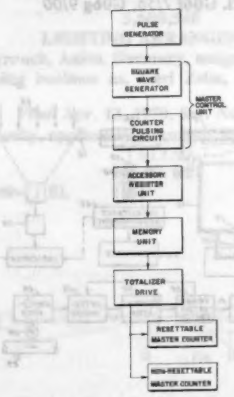
**3,600,560**

**RATE/TIME COMPUTER**

**Russell N. Gosselin, Salem, N.H., and Joseph B. Melanson, Salem, Mass., assignors to General Tally Computers, Inc., Salem, N.H.**

**Filed May 19, 1969, Ser. No. 825,846**
**Int. Cl. G06f 7/38**
**U.S. Cl. 235—92 ST** **8 Claims**




A rate/time computer which comprises a pulse generator adapted to transmit pulses at various selected frequencies which selected frequencies correspond to preselected monetary values. A plurality of accessory register assemblies are in communication with the pulse generator and may be actuated to respond to one or more of the selected frequencies. If the accessory register assembly is actuated to correspond to two of the pulsed frequencies, then a transmitter located in each accessory register allows a counter disposed within the register to register or count the total accumulated pulses serially within a given preselected time period. If one or more accessory registers are actuated to be responsive to one or more of the selected pulse frequencies from the pulse generator, then at the same time pulses are acknowledged by the accessory register, the pulses are accumulated in a master totalizer so that the total count of all registers being employed may be recorded.

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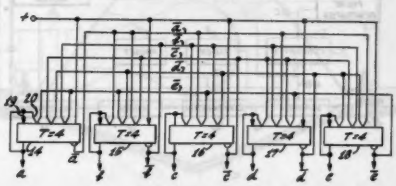
**3,600,561**

**DECADE COUNTER EMPLOYING LOGIC CIRCUITS**

**Robert Owen Winder, Princeton, N.J., assignor to RCA Corporation**

**Filed Sept. 25, 1969, Ser. No. 861,038**
**Int. Cl. H03k 21/00**
**U.S. Cl. 235—92 LG** **6 Claims**



In a decade counter comprised of five threshold gates, each producing two output signals, the first signal indicative of a bit and the second of its complement. A clock pulse and its own first signal are applied to each circuit. The second signal produced by each circuit is applied to the remaining four circuits.

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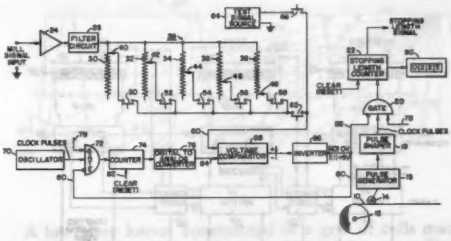
**3,600,562**

**COMPUTER SYSTEM FOR DETERMINING THE STOP LENGTH REQUIRED TO ARREST A MOVING STRIP OF MATERIAL**

**Frank DiNicolantonio, Williamsville; Volt C. Drankhan, Hamburg, and Paul W. Wagener, Depew, all of, N.Y., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.**

**Filed Dec. 19, 1969, Ser. No. 886,697**
**Int. Cl. G06g 7/78**
**U.S. Cl. 235—151.32** **5 Claims**

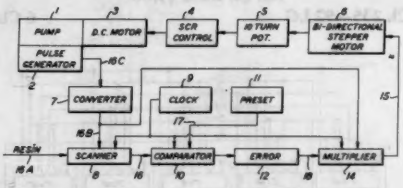



This disclosure relates to a computer for determining the length of material required in order to arrest a moving strip of material in a preselected deceleration time, the material being payed out from a reel in a mill operated at a predetermined mill speed. An analog signal, which is a function of the mill speed and deceleration time, is applied to a voltage comparator. Another input to the voltage comparator is a ramp signal. A train of pulses, synchronized with the ramp signal, is generated as a function of the payed out length of the strip material, the pulses being counted by a stop length counter. When the voltage comparator has inputs which are equal in magnitude, an inhibit signal is developed which is applied to inactivate the stop length counter, the cumulative counts of which will then be a function of the length of material required to stop the mill for the mill speed and deceleration time selected by the mill operator.

## 3,600,563
## METHOD AND APPARATUS FOR DETERMINING THE TRUE DIFFERENCE OR ERROR BETWEEN TWO FREQUENCIES

Lawrence C. Porter, Palos Verdes Peninsula, and Kenneth E. Graves, Saratoga, both of, Calif., assignors to The Upjohn Company, Kalamazoo, Mich.

Filed May 31, 1968, Ser. No. 733,533
Int. Cl. G06g 7/57
U.S. Cl. 235—150.3 31 Claims

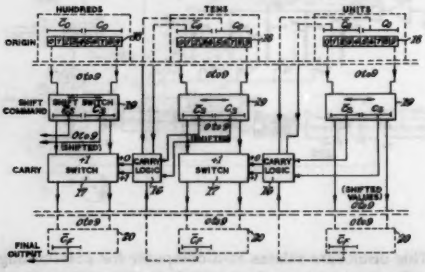



Methods and apparatus are disclosed for time base correction of error computations derived from comparisons of samples of two frequencies. If an incoming frequency is sampled during a time interval different from the time base of the sampled frequency, and if the frequency sample is compared with a preselected frequency, the difference will be an "apparent" error represented by one or more pulses. This invention provides methods and apparatus for deriving "true error" as the product of "apparent error" and a factor functionally related to the ratio of the time base of sampled frequency to the sampling time interval.

## 3,600,564
## DIGITAL MULTIDENOMINATIONAL SCALE MODIFYING MEANS

David Silvester Evans, Walworth, England, assignor to Moore Reed (Industrial) Limited, Walworth, England

Filed Mar. 11, 1968, Ser. No. 712,079
Int. Cl. G06f 3/00
U.S. Cl. 235—154 4 Claims

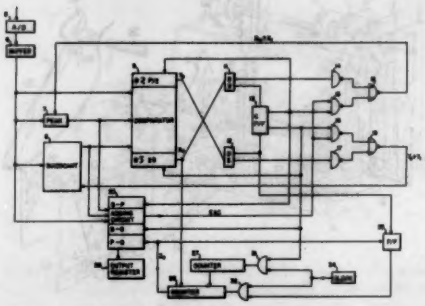



The present invention relates to apparatus for modifying the reading of a multidenominational scale of a digital measuring system and in a practical embodiment this is achieved by classifying the figures of each denomination of the scale and of the figures by which they can be shifted into groups such that, in respect to some shifts, the result must necessarily give rise to a carry to the next higher denomination than the one in which the shift has been made, and in respect of other shifts, the result must necessarily fail to give rise to a carry to said next higher denomination, whereby only a number of shifts, considerably less than the total number possible, remain in respect of which the need exists to determine whether the radix of the denomination in question has been exceeded by the shift effected.

## 3,600,565
## SIGNAL TRACKER AND ANALYZER

Donald F. Forbes, Sr., Fairfax, Va., assignor to The United States of America as represented by the Secretary of the Navy

Filed Jan. 2, 1969, Ser. No. 789,107
Int. Cl. G06f 7/38, 7/02
U.S. Cl. 235—168 6 Claims

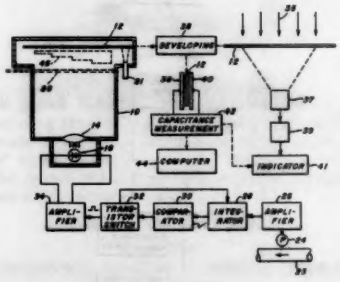


The invention comprises a system using digital techniques, for retrieving information contained in the amplitude variations of a received signal. The invention comprises a first register which instantaneously tracks the received signal, a second register which tracks the highest and a third register which tracks the lowest value of the signal. The outputs of the second and third registers are subtracted in order to arrive at the information desired.

## 3,600,566
## METHOD FOR INTEGRATING ELECTRICAL SIGNALS OVER LONG TIME PERIODS

Jesse R. Conner, Pittsburgh, and Kenneth E. Ball, Bridgeville, both of, Pa., assignors to Environmental Science Inc., Pittsburgh, Pa.

Filed Mar. 20, 1970, Ser. No. 21,371
Int. Cl. G06f 7/56; G06g 9/00
U.S. Cl. 235—183 7 Claims

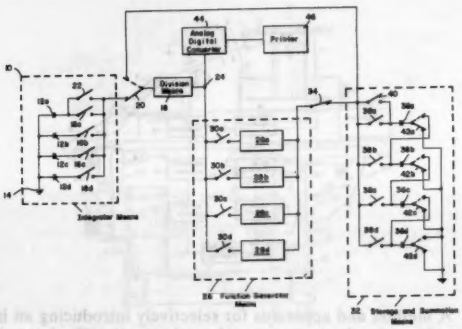



Method for integrating an electrical signal over long time periods and for storing the integral chemically. This is accomplished by converting the output signal of a transducer into a constant intensity light pulse whose frequency is proportional to the magnitude of the signal (digital techniques) or by applying the output of the transducer to an incandescent lamp or the like (analog techniques). The emitted light is directed onto photographic film which characteristically has a logarithmic response to the incident light, thereby accommodating a wide range of accumulated light pulses, or considering the total system, integrating analog signals over a long time period.

## 3,600,567
## METHOD AND APPARATUS FOR ANALOG COMPUTATION OF CONCENTRATIONS

Veljo V. Varnola, San Gabriel, Calif., assignor to Angstrom, Inc., Chicago, Ill.

Filed Mar. 17, 1969, Ser. No. 807,838
Int. Cl. G06q 7/16
U.S. Cl. 235—196 17 Claims

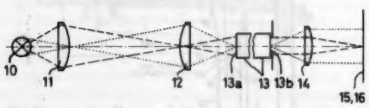



An analog method and apparatus for automatically determining the concentration of elements in a material subjected to spectrochemical analysis, from electrical signals representing ratios of the concentrations of each of the elements to a particular element. The concentration ratio signals are applied to respective storage devices. The storage devices are momentarily interconnected to generate a summation signal representing the sum of the stored ratio signals and the summation signal is applied as a divisor to a division circuit. The stored concentration ratio signals are sequentially applied as dividends to the division circuit which produces output signals respectively representing the concentrations of the various elements in the material.

## 3,600,568
## LIGHTING ARRANGEMENT

Adolf Weyrauch, Aalen, Germany, assignor to Carl Zeiss-Stiftung doing business as, Carl Zeiss, Wuerttemberg, Germany

Filed Apr. 13, 1970, Ser. No. 27,753
Claims priority, application Germany, Apr. 12, 1969, P 19 18 612.0
Int. Cl. F21
U.S. Cl. 240—1 EL 5 Claims

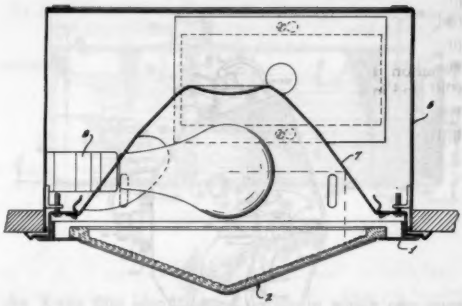



An illuminating device for projecting light from a source into the object plane of an object to be illuminated, or into the plane of an incidence aperture of a measuring microscope or other observation instrument, includes: an optical fiber light conductor, a first lens arranged to project an image of the light source, a second lens to project the latter image onto the incidence surface of the conductor, and third lens means arranged for focusing light emerging from the light emergence surface of the conductor into an object plane, or into the plane of an incidence aperture of an observation instrument.

## 3,600,569
## LUMINAIRE

Arthur W. Matteson, Webster Groves, Mo., assignor to The Edwin F. Guth Company, Saint Louis, Mo.

Filed Jan. 24, 1969, Ser. No. 793,813
Int. Cl. F21s 1/06
U.S. Cl. 240—78 LD 9 Claims

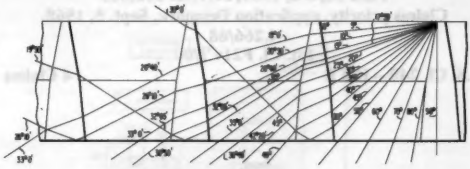


Corridor illumination with globular source embraced by a moldable lens whose interior and exterior surfaces are prismatic and coordinated with the reflectances of the floor, walls and ceiling of the corridor ultimately to distribute the lens-transmitted-light in the proportions of about 35 percent to the floor, 25 percent to each sidewall, and 15 percent to the ceiling.

## 3,600,570
## LOW GLARE LOUVER

Mizuo Okada, Kozagun, Japan, assignor to Mitsubishi Rayon Company, Limited, Tokyo, Japan

Filed Dec. 10, 1968, Ser. No. 782,557
Claims priority, application Japan, Dec. 11, 1967, Dec. 25, 1967, 42/103476;42/108002
Int. Cl. F21s 1/06
U.S. Cl. 240—78 LD 6 Claims



A low glare louver constructed of a grid of cells made of transparent material produces a low brightness ceiling by controlling the light from the light source. The opposite surfaces of each beam of the grid slope downwardly producing a thicker base for forming a multiprism lens or a cylindrical lens.

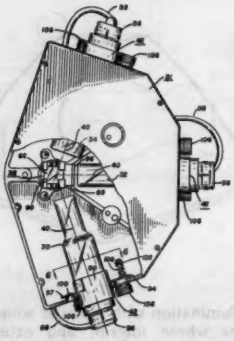
## 3,600,571
## MULTIPLE LAMP HOUSING AND BURNER ASSEMBLY FOR PHOTOMETRIC APPARATUS

James J. Chisholm, Penfield, and Henry J. Emmel, Irondequoit, both of, N.Y., assignors to Bausch & Lamb Incorporated, Rochester, N.Y.

Division of Ser. No. 617,103, Feb. 20, 1967, Patent No. 3,523,748. Filed June 6, 1969, Ser. No. 830,977
Int. Cl. F21u 13/04; G01j 3/42
U.S. Cl. 240—41.35 4 Claims

A lamp housing and burner assembly is disclosed for use with photometric apparatus for determining and/or measuring the concentration of atoms by an atomic absorption

phenomenon. A plurality of adjustable light sources emitting radiation that is characteristic of particular atoms are mounted in radial relation about an optical means. The optical means is adapted to select radiation from a particular source and to direct a beam of radiation through a flame zone of a burner into which a test solution is aspirated. The burner is a slot-type burner that is rotatably, horizontally,



and vertically adjustable to control the position of the flame through which the beam passes. An adjustable aspirator assembly is provided for the burner to control the aspiration efficiency. A piezoelectric ignition system is provided for the burner that automatically moves a spark device into and out of the flame zone while simultaneously generating a high voltage for creating the spark.

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**3,600,572**

## LAMP SHADE AND METHOD OF MANUFACTURING SAME

**Jorgen Grunwald, Sollerodgaardsvej 29, 2840 Holte, Denmark**

**Filed Sept. 2, 1969, Ser. No. 862,605**
**Claims priority, application Denmark, Sept. 5, 1968, 4,266/68**
**Int. Cl. F21v *1/00***
**U.S. Cl. 240—108 R** **4 Claims**

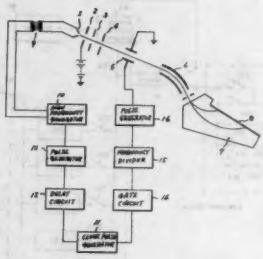
A lamp shade is provided which consists of a spiral strip cut out of a plane sheet and is maintained in a hybrid spiral and helical path by means of strips or filaments extending transversely of the turns of the spiral strip and attached thereto in the points of intersection. To provide such a lamp shade a method is provided, according to which a spiral strip is first cut out of a plane sheet and is then pulled out perpendicularly to its plane by attaching supporting strips or filaments to the spiral strip in predetermined attachment areas thereof.

**3,600,573**

## ION BEAM INTENSITY CONTROL WITH PULSED BEAM DEFLECTOR AND SYNCHRONIZED ION SOURCE BLANKING

**Eiji Watanabe, Tokyo, Japan, assignor to Nihon Denshi Kabushiki Kaisha, Tokyo, Japan**

**Filed Oct. 6, 1969, Ser. No. 864,054**
**Claims priority, application Japan, Oct. 9, 1968, 43/73690**
**Int. Cl. H01j *39/34, 37/34***
**U.S. Cl. 250—41.9 ME** **4 Claims**



A method and apparatus for selectively introducing an intermittent ion beam to an analyzer by passing the intermittent ion beam through deflection electrodes to which generated pulses are applied to direct the ion beams in a manner that the intermittent ion beam does not pass the electrodes at a rising and falling time of the pulses. The pulses selectively project into the analyzer the intermittent ion beam in accordance with the amount of exposure.

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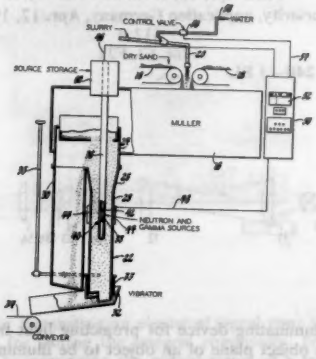
**3,600,574**

## RADIOMETRIC METHOD AND APPARATUS FOR MEASURING AND CONTROLLING FOUNDRY SAND MOISTURE

**Donald D. Glaza, Warren, and Arthur D. Block, Farmington, both of, Mich., assignors to General Motors Corporation, Detroit, Mich.**

**Continuation of application Ser. No. 692,742, Dec. 22, 1967, now abandoned. This application May 12, 1969, Ser. No. 827,086**
**Int. Cl. G01t *1/16*; G01n *23/14***
**U.S. Cl. 250—45** **7 Claims**



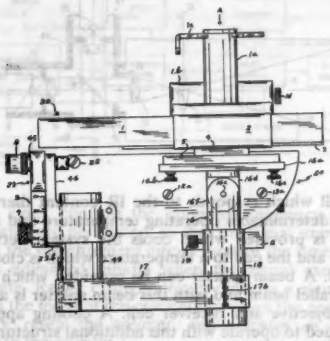

To measure the amount of water present in foundry sand continuously flowing through a chute, a probe within the chute carries a fast neutron source and a slow neutron detector to detect the amount of water in the sand. A gamma source in the probe and a gamma detector outside the chute measure the sand density. The detector output signals are arithmetically combined to give a signal proportional to percent moisture by weight. The signal may be used to control water addition to the sand.

3,600,575

## CRYSTAL MOUNT AND GONIOMETER FOR TAKING LAUE PATTERNS AND FOR ORIENTATION OF LARGE SINGLE CRYSTALS

Frank L. Chan, 3228 Ravenwood Road, Fairborn, Ohio

Filed May 5, 1969, Ser. No. 821,595
Int. Cl. G01n *23/20*
U.S. Cl. 250—51.5 3 Claims



A combined, portable crystal mount and goniometer apparatus having built-in vertical and horizontal goniometer members, and an adjustably mounted crystal holder member adapted to be rigidly positioned on the camera track of a standard type of X-ray diffraction apparatus and thereby extend the latter's inherent ability in taking Laue patterns of small types of crystalline structures to the further capability of taking X-ray diffraction pictures of the relatively large or macro-type crystal.

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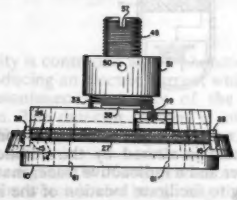
3,600,576

## GONIOMETER DEVICE

Forrest L. Carter, 8000 MacArthur Blvd., Cabin John-Bethesda, Md., and Walter C. Sadler, 4903 Prince George Ave., Beltsville, Md.

Filed June 2, 1969, Ser. No. 829,338
Int. Cl. G01n *23/20*
U.S. Cl. 250—51.5 R 4 Claims



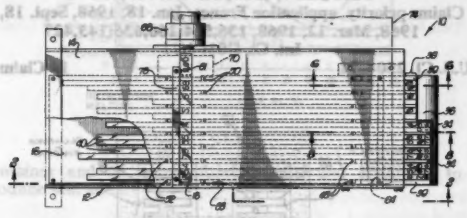
This disclosure is directed to an arcless goniometer head which supports a single crystal specimen for examination by the use of X-rays of neutrons. The device is made for X–Y adjustment of the crystal as well as for height adjustment and the crystal is so mounted that the mount may be removed with the crystal thereon for use of the device for other crystal studies through use of other mounts. The X–Y translation mechanisms are housed within a low flat housing which is removed from the crystal the maximum distance possible such that the crystal may be adjusted without exposure of ones hands during the adjustment. Thus, the crystal mounting rod extends considerable distance from the base such that high or low temperature may be used without the base affecting the temperature.

3,600,577

## RADIOGRAPHIC FILM IDENTIFICATION DEVICE

William D. Lovison, 4902 Willmonte Ave., Temple City, Calif.

Filed July 18, 1969, Ser. No. 843,082
Int. Cl. G03b *41/16*
U.S. Cl. 250—67 5 Claims



An X-ray film identification device in which one unexposed edge of an X-ray film is placed adjacent a radiation transparent window in which is displayed a set of identifying characters. The identifying characters are located on slidable strips which are guided individually from a remote location into registering position with the window. One end of each of the individual strips is attached to a separate wheel which is rotated to bring various indicia on the strips into registering location with the window.

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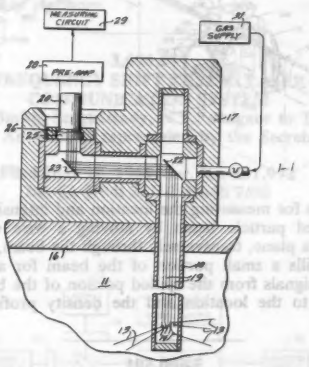
3,600,578

## REACTOR POWER LEVEL SENSING DEVICE USING CHERENKOV RADIATION

Karl G. Porges, Evanston, and Raymond Gold, Woodridge, both of, Ill., assignors to The United States of America as represented by the United States Atomic Energy Commission.

Filed Oct. 7, 1969, Ser. No. 864,443
Int. Cl. G01t *1/20*
U.S. Cl. 250—71.5 R 6 Claims



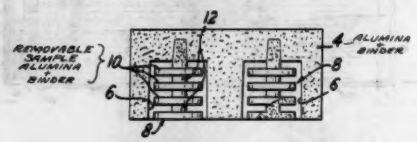

A gas filled probe is positioned within a reactor to intercept gamma rays developed therein. The gamma rays above a predetermined threshold energy level develop Compton recoil electrons in the gas and tube with velocities greater than the velocity of light in the gas. The Cherenkov radiation resulting from the slowing down of the electrons is detected and measured by a photomultiplier to measure the power level of the reactor.

3,600,579

## THERMAL LUMINESCENT MATERIAL FOR IONIZING RADIATION DOSIMETRY

Serge Carpentier, Creteil; Radovan Dajlevic, Rontenay-aux-Roses; Roger Delarue, Paris; Henri Francois, Paris; Guy Portal, Massy; Jacques Pradel, Malakoff, and Georges Soudain, Antony, all of, France, assignors to Commissariat A L'Energie Atomique, Paris, France

Filed Jan. 7, 1969, Ser. No. 789,460
Claims priority, application France, Jan. 18, 1968, Sept. 18, 1968, Mar. 12, 1968, 136,564;166,636;143,427
Int. Cl. G01t 1/11
U.S. Cl. 250—71 10 Claims



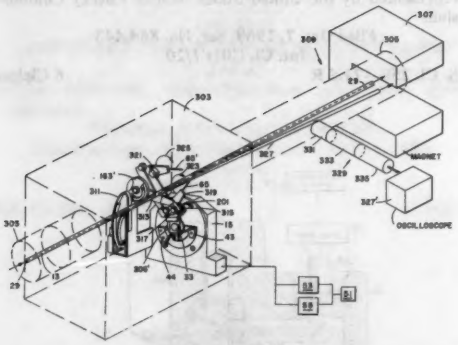

The material essentially consists of alumina $Al_2O_3$ in the form of particles smaller in size than 400 $\mu$. A proportion higher than 80 percent by weight should be in the form of alpha crystals. A proportion of particles at least equal to 60 percent has a size higher than 10 $\mu$. The alumina may be used in powdered form or included in a construction material.

3,600,580

## CHARGED PARTICLE BEAM DENSITY MEASUREMENT DEVICE

Uriel Vogel, Patchogue, N.Y., assignor to The United States of America as represented by the United States Atomic Energy Commission

Filed Sept. 22, 1969, Ser. No. 859,783
Int. Cl. G01j 39/18
U.S. Cl. 250—71.5 R 5 Claims




Apparatus for measuring the location and intensity profile of a charged particle beam by moving a wire with high velocity, in a plane, transversely through the beam, whereby the wire spills a small portion of the beam for accurately generating signals from the spilled portion of the beam corresponding to the location and the density profile of the beam.

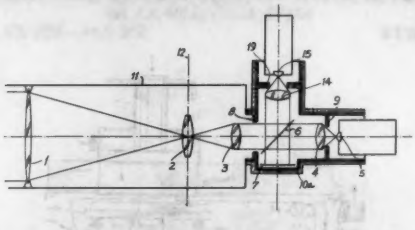
3,600,581

## IR-OPTICAL IMAGE REPRODUCING SYSTEM AND METHOD

Josef-Ferdinand Menke, Glucksburg, Germany, assignor to Eltro GmbH & Co., Heidelberg, Germany

Filed Aug. 18, 1969, Ser. No. 851,021
Claims priority, application Germany, Aug. 16, 1968, P 17 97 108.3
Int. Cl. G01t 1/16
U.S. Cl. 250—83 R 6 Claims

An IR-optical image reproduction system which comprises an objective, a field lens and collimator arranged in optical series. The objective focuses the incoming image at an image plane and the field lens is positioned at this plane. The collimator forms a parallel beam path of smaller diameter than that of the image entering the objective. A stop is positioned in the path and is provided with an aperture which permits the passage of the parallel beam while blocking heat rays which might be generated upstream of the stop. A second objective receives the parallel beam and focuses an image at a



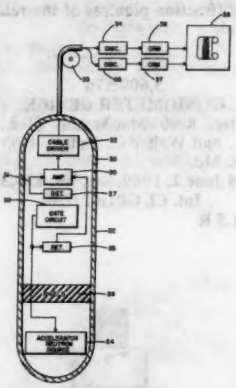
receiver all which responds to the IR content thereof. This cell has a determinable operating temperature and a cooling apparatus is provided which cools the system between the collimator and the cell to a temperature which is close to that of the cell. A beam splitter can be provided which operates on the parallel beam and with this beam splitter is associated another objective and receiver cell. A cooling apparatus is also provided to operate with this additional structure.

3,600,582

## RADIOACTIVE TRACER WELL LOGGING

Mike Davis, and Arthur H. Youmans, Both of Houston, Tex., assignors to Dresser Industries, Inc., Dallas, Tex.

Filed June 3, 1968, Ser. No. 733,878
Int. Cl. G01v 5/00
U.S. Cl. 250—83.3 7 Claims



The thermal neutron capture cross section of the fluid in an earth borehole is altered by the addition of a soluble neutron absorber and a radioactive tracer material, the tracer material serving to facilitate location of the injected fluid by means of a radiation detector and the neutron absorber serving to facilitate measurement of the pore volume occupied by the injected fluid in the formations surrounding the borehole by measurement of the thermal neutron capture cross section of the formation.

3,600,583

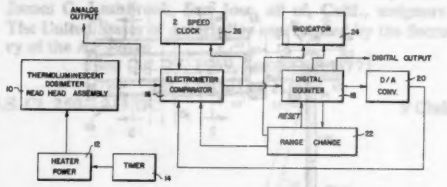
## APPARATUS AND METHODS FOR READING THERMOLUMINESCENT DOSIMETERS AND THE LIKE

Donald A. Paynter, Goleta, Calif., assignor to EG & G, Inc., Bedford, Mass.

Filed Mar. 24, 1969, Ser. No. 809,721
Int. Cl. G01t 1/16
U.S. Cl. 250—83.3 10 Claims

Thermoluminescent dosimeter reader in which dose measurements are based on the glow curve peak. Measurements

are made by comparing the output of a photomultiplier tube with the analog-converted state of a digital counter, the comparison being performed by alternately connecting a capacitor to the output of the digital-to-analog converter and to the signal from the photomultiplier, periodically, in order to produce error pulses which are amplified in an AC amplifier and which advance the counter when the sense of the error indicates that the signal is greater than the counter state. A




two-speed clock controls the sampling frequency at which measurements are performed, so that the signal source is isolated from the measurement circuit most of the time, and the counter is advanced rapidly when the signal exceeds the counter state. Range change circuitry inserts a shunting impedance in the input of the comparator when the counter fills to capacity, resets the counter, and actuates an indicator connected to the counter.

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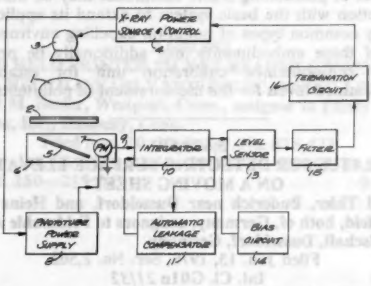
**3,600,584**

## X-RAY PHOTOTIMER THAT IS COMPENSATED FOR DARK CURRENT

**John E. Schneble, Wauwatosa, Wis., assignor to General Electric Company**

**Filed May 28, 1969, Ser. No. 828,682**
**Int. Cl. G03b *41/16*; H01j *39/12***
**U.S. Cl. 250—95** **1 Claim**




X-ray film density is controlled with a phototimer that uses a detector for producing an electric current which is proportional to the instantaneous intensity of the X-rays that penetrate the film. The detector current is integrated with respect to time. The exposure is ended when the integrator output changes by a certain amount in which case the output from the integrator signals the X-ray generator to terminate. At this time, the film which is also integrating the X-radiation should be properly exposed. Leakage current varies between detectors and ordinarily causes an error in the integrated signal and, hence, in the exposure time. A circuit is provided to compensate for whatever leakage current error would exist with the particular detector that is used.

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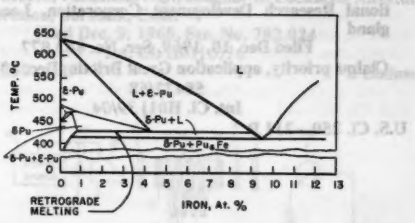
**3,600,585**

## PLUTONIUM HEAT SOURCE

**Donald P. Kelly, Dayton, Ohio; James A. Powers, Rockville, Md., and Philip A. Tucker, Dayton, Ohio, assignors to The United States of America as represented by the United States Atomic Energy Commission**

**Filed Feb. 3, 1967, Ser. No. 616,422**
**Int. Cl. G21h *5/00***
**U.S. Cl. 250—106 S** **4 Claims**

A radioisotopic heat source for a thermoelectric generator having a plutonium-238 alloy enclosed within a tantalum




container and an arc melting method and apparatus to produce said alloy.

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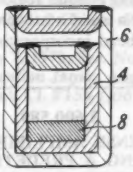
**3,600,586**

## α-RAY HEAT SOURCE, SUITABLE FOR USE IN A CARDIAC PACEMAKER

**Pierre Barthelemy, Fontenay-Aux-Roses, and Rene Boucher, Paris, both of, France, assignors to Commissuriat A L'Energie Atomique, Paris, France**

**Filed Nov. 5, 1968, Ser. No. 773,377**
**Claims priority, application France, Nov. 9, 1967, 127637**
**Int. Cl. G21h *1/10***
**U.S. Cl. 250—106** **8 Claims**




The heat source comprises a leak-tight container and a body of α-ray emitting material in the container. The material is an alloy of Pu 238 and of Sc, Ce, In, Ga or Am in such proportions that the alloy is in δ phase. The container consists of an inner sheath of tantalum or tungsten and of an outer sheath of platinum.

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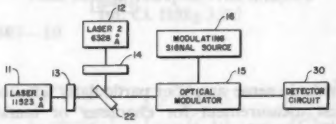
**3,600,587**

## FREQUENCY SHIFT KEYING LASER COMMUNICATION SYSTEM

**Donald A. Smith, Schenectady, N.Y., assignor to The United States of America as represented by the Secretary of the Army**

**Filed June 10, 1969, Ser. No. 831,972**
**Int. Cl. H04l *27/10*; H04b *9/00***
**U.S. Cl. 250—199** **13 Claims**



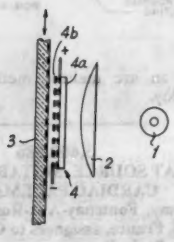

An optical frequency shift keying system for representing a first binary signal condition by a first optical frequency and a second binary signal condition by a second optical frequency by means including an optical modulator biased to provide optical transmission predominantly at one of said optical frequencies during one of said signal conditions and to provide transmission at the other of said optical frequencies during the second condition.

3,600,588

## PHOTOELECTRIC OPTICAL GRATING

Leonard Alfred Sayce, Glasgow, Scotland, assignor to National Research Development Corporation, London, England

Filed Dec. 10, 1969, Ser. No. 883,877
Claims priority, application Great Britain, Dec. 13, 1968, 59477/68
Int. Cl. H01j 39/04
U.S. Cl. 250—211 R 5 Claims




An index grating for use in measuring apparatus in which relative movement between the index grating and a scale grating is monitored, consisting of a regular series of alternate transparent and opaque regions, the opaque regions constituting parts of a solid state photocell. There is also described a reading head incorporating such an index grating.

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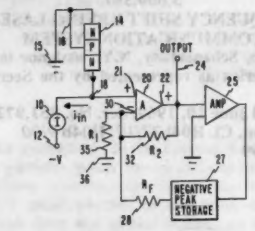
3,600,589

## LOGARITHMIC SENSE AMPLIFIER HAVING MEANS FOR ESTABLISHING A PREDETERMINED OUTPUT VOLTAGE LEVEL WHEN THE INPUT SIGNAL IS AT A MAXIMUM

Charles C. Hanson, Rochester, Minn., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 18, 1968, Ser. No. 768,706
Int. Cl. H01j 39/12; H03k 3/42; H03f 1/36
U.S. Cl. 250—214 12 Claims



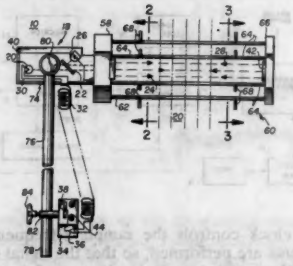

A logarithmic sense amplifier particularly adapted for use in contrast measurement for character or mark reading systems. The amplifier includes an input circuit combining a photodevice sensor consisting of a diode having a logarithmic characteristic for range compression and a compatible differential amplifier having a feedback network which includes an output voltage comparator and a peak voltage storage device to feedback a signal to the input of the amplifier so that steady state input signals are balanced out in the output such that only incremental input changes evidencing the presence of a mark will be present in the output of the differential amplifier of the amplifying system.

3,600,590

## GAS MEASURING APPARATUS FOR DETECTING CONTAMINANTS

Harry Einstein, c/o Nebetco Engineering, 1107 Chandler Ave., Roselle, N.J.

Filed Nov. 12, 1968, Ser. No. 774,871
Int. Cl. G01n 21/26
U.S. Cl. 250—218 23 Claims



Gas measuring apparatus is disclosed for detecting the presence of particles and other contaminants suspended in exhaust gases and the like. The apparatus includes a sensing system, preferably a photoelectric transceiver including a light source and detector mounted within a single housing, located out of the path of the gas being measured to prevent the contamination thereof. The sensing system disperses visible light (ultraviolet or infrared may be utilized) into the gas being measured such that the amount of light reflected and detected provides an output signal representative of the presence of particles and other contaminants suspended in the gas. An output system including an appropriate meter is responsive to the signal developed by the sensing system to provide a visible indication of the pollution of the gas. Various types of positioning frame assemblies may be utilized in conjunction with the basic system to extend its applicability to many common types of pollution expelling environments. Each of these embodiments may additionally be provided with a self-contained calibration unit for establishing predetermined levels for the measurement of pollutants.

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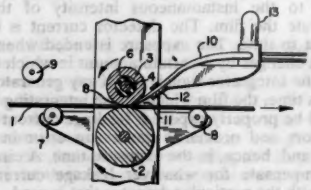
3,600,591

## APPARATUS FOR DETECTING SURFACE ELEVATIONS ON A MOVING SHEET

Richard Thier, Buderich near Dusseldorf, and Heinz Voigt, Bielefeld, both of, Germany, assignors to Feldmuhle Aktiengesellschaft, Dusseldorf, Germany

Filed Jan. 13, 1970, Ser. No. 2,502
Int. Cl. G01n 21/32
U.S. Cl. 250—219 DF 5 Claims



Surface elevations such as wrinkles are detected in a moving, normally smooth-surfaced paper sheet by passing the sheet between a driven cylinder having a fixed axis of rotation and an idler cylinder yieldably biased toward the driven cylinder so as normally to define a continuous line of contact with the moving sheet. When a surface elevation causes a portion of the idler cylinder to be lifted from the moving sheet, light from a lamp on one side of the line of contact reaches transverse end faces of light conducting fibers ar-

ranged contiguously adjacent the other side of the line in a row parallel to the line. The fibers conduct the received light to photomultiplier tubes to generate an electric signal indicative of the magnitude and location of the surface elevation.

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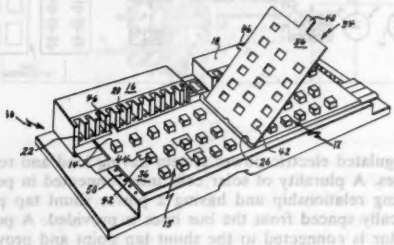
**3,600,592**

**PHOTOSENSING FOLIO KEYED KEYBOARD**

**Ralph E. Mahan, San Jose; James K. Gerrie, Sunnyvale, and James C. Lashbrook, San Jose, all of, Calif., assignors to The United States of America as represented by the Secretary of the Air Force**

**Filed Oct. 27, 1969, Ser. No. 869,771**
**Int. Cl. G01n *21/30***
**U.S. Cl. 250—219 DC** **9 Claims**



A photosensing keyboard which is utilized in conjunction with a folio. The folio is mounted on the face of the keyboard. The keyboard has a first and second photosensing means therein. The photosensing means and folio are interrelated in such a manner that the keyboard is capable of detecting the presence of the folio thereon and also the specific page the folio is opened to.

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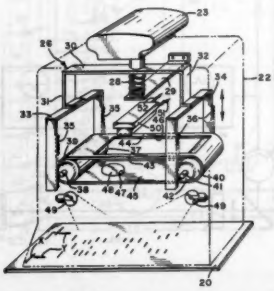
**3,600,593**

**HAND HELD PRINTED TICKET READER COMPRISING A RECTILINEARLY MOVING SCANNING LENS**

**Robert M. Berler, Westport, Conn., assignor to Pitney Bowes-Alpex, Inc., Danbury, Conn.**

**Filed Nov. 10, 1969, Ser. No. 875,473**
**Int. Cl. G01n *21/30*; G06k *7/00*; H01j *3/14***
**U.S. Cl. 250—219 DC** **9 Claims**



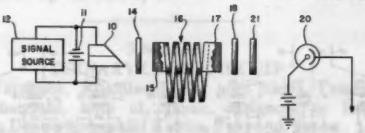
A photo optical hand held reader which is positionable over a printed mark document and held stationary while a lens contained in the reader housing is moved so as to scan the printed information on the document. A light source housed in the reader provides the necessary illumination to permit the images from the printed marks to be reflected through the lens to an array of photoelectric sensors which converts the images, by means of logic and other signal processing circuits, to intelligible information.

**3,600,594**

**FIBER OPTICS PULSE WIDTH MODULATOR**

**John F. Moore, Plainfield, N.J., assignor to Lockheed Aircraft Corporation, Burbank, Calif.**

**Filed Dec. 9, 1968, Ser. No. 782,024**
**Int. Cl. H01j *5/16***
**U.S. Cl. 250—227** **8 Claims**




An optical pulse width modulator having a spiral stack of optical fibers providing a plurality of independent channels of different length for the passage of light. A suitable light source is intensity modulated in accordance with an applied electronic signal waveform and the light directed through the stack of optical fibers. The light emerging from the fibers is correlated with a waveform pattern in an optical grating and detected photoelectrically as a width modulated signal representing the correlation function between the applied electronic signal and the optical grating.

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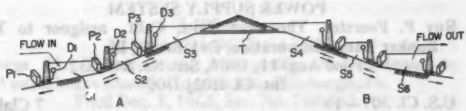
**3,600,595**

**METHOD AND ARRANGEMENT FOR INTERCONNECTING HYDROELECTRIC PUMPING-UP POWER SYSTEM**

**Kei Yasunobu, 11-22-304 5-Chome Roppongi, Minato-Ku, Tokyo, Japan**

**Filed July 7, 1970, Ser. No. 52,929**
**Claims priority, application Japan, Aug. 7, 1969, 44/62048**
**Int. Cl. F15b *1/06***
**U.S. Cl. 290—52** **2 Claims**




Interconnection of a plurality of hydroelectric pumping-up power systems is achieved by providing two groups of pumping-up hydroelectric power plants on respective sides of a mountain and by accommodatively transferring water thus pumped up between water reservoirs provided at the highest levels on respective sides of the mountain through a corresponding number of water tunnels or the like, and the water thus transferred can be utilized for various purposes in addition to hydroelectric power generation.

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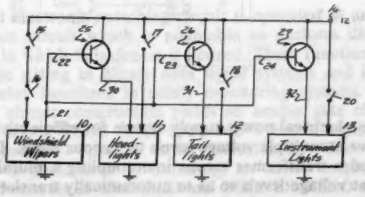
**3,600,596**

**VEHICLE LIGHT SWITCH APPARATUS**

**John R. Aloisantoni, 722 South Ranger Blvd, Winter Park, Fla.**

**Filed June 5, 1969, Ser. No. 830,599**
**Int. Cl. H02g *3/00***
**U.S. Cl. 307—10** **7 Claims**

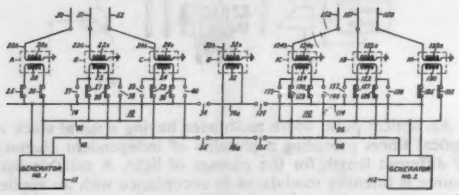



A vehicle light switch apparatus is provided for turning the lights of a vehicle on and off automatically upon turning the windshield wipers for the vehicle on and off without otherwise affecting the main light switch for the vehicle.

## 3,600,597
## SPARE TRANSFORMER CONNECTING MEANS

Nathan Swerdlow, Philadelphia, Pa., assignor to General Electric Company

Continuation-in-part of application Ser. No. 794,049, Jan. 27, 1969, now Patent No. 3,519,838. This application Mar. 24, 1970, Ser. No. 22,329
Int. Cl. H02j 3/00
U.S. Cl. 307—17 7 Claims

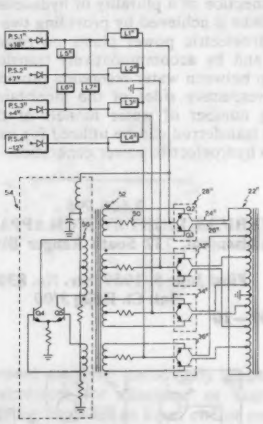


Discloses a power system in which first, second and third single-phase transformers have their primary windings connected in delta. A spare transformer is disposed physically adjacent the third transformer and is provided with switching means for connecting its primary winding to the bus in a manner that enables the spare to serve as a replacement for the third transformer. Additional switching means is provided for connecting the primary winding of the third transformer to the bus in a way that enables the third transformer to serve as a replacement for the second transformer, should such replacement be necessary. Still additional switching means is provided for connecting the primary of the second transformer to the bus in a way that enables the second transformer to serve as a replacement for the first transformer, should this latter replacement be necessary.

## 3,600,598
## POWER SUPPLY SYSTEM

Roy P. Foerster, Thousand Oaks, Calif., assignor to The Bunker Ramo Corporation, Oak Brook, Ill.

Filed Aug. 11, 1969, Ser. No. 849,032
Int. Cl. H02j 1/00
U.S. Cl. 307—19 7 Claims

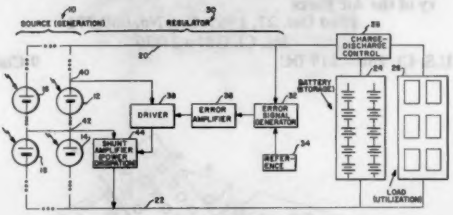


An electrical power supply system for efficiently supplying power at multiple voltage levels to various loads. The system includes transformer means intercoupling a plurality of different voltage levels so as to automatically translate or redistribute power as load conditions change. For example, as load current directions change, power is translated with minimum loss from levels acting as a current sink to levels requiring a current source.

## 3,600,599
## SHUNT REGULATION ELECTRIC POWER SYSTEM

Warren H. Wright, Palos Verdes, and John J. Biess, Canoga Park, both of, Calif., assignors to TRW Inc., Redondo Beach, Calif.

Filed Oct. 3, 1968, Ser. No. 764,823
Int. Cl. H02j 1/10, 3/38, 7/34
U.S. Cl. 307—53 2 Claims

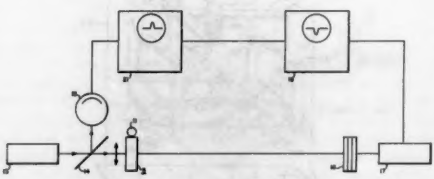



A regulated electric power system having load and return bus lines. A plurality of solar cells interconnected in power supplying relationship and having a power shunt tap point electrically spaced from the bus lines is provided. A power dissipator is connected to the shunt tap point and provides for a controllable dissipation of excess energy supplied by the solar cells. A dissipation driver is coupled to the power dissipator and controls its conductance and dissipation and is also connected to the solar cells in a power taping relationship to derive operating power therefrom. An error signal generator is coupled to the load bus and to a reference signal generator to provide an error output signal which is representative of the difference between the electric parameters existing at the load bus and the reference signal generator. An error amplifier is coupled to the error signal generator and the dissipation driver to provide the driver with controlling signals.

## 3,600,600
## OPTICAL HARMONIC GENERATING MEDIUM AND MODULATING DEVICE

Paul P. Bey, Oxon Hill; John F. Giuliani, Kensington, and Herbert Rabin, Bethesda, all of, Md., assignors to The United States of America as represented by the Secretary of the Navy

Filed Sept. 25, 1968, Ser. No. 762,553
Int. Cl. HO2m 5/00
U.S. Cl. 307—88.3 4 Claims



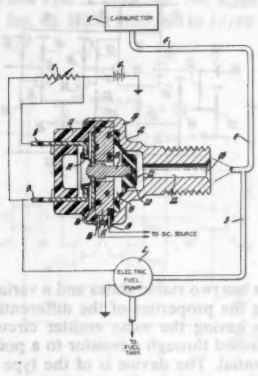
This disclosure is directed to a device which generates an enhanced third harmonic light wave of the neodymium laser by the introduction of anomalous dispersion into a liquid medium to produce phase matching of the interacting waves, and applications thereof which depend upon the state of polarization of the incident laser radiation.

The invention described herein may be manufactured and used by or for the Government of the United States of America for governmental purposes without the payment of any royalties thereon or therefor.

## 3,600,601
## PRESSURE MODULATOR SWITCH FOR ELECTRIC FUEL PUMP

John A. Ayres, Flint, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Dec. 15, 1969, Ser. No. 884,817
Int. Cl. H02g 3/00
U.S. Cl. 307—118 3 Claims

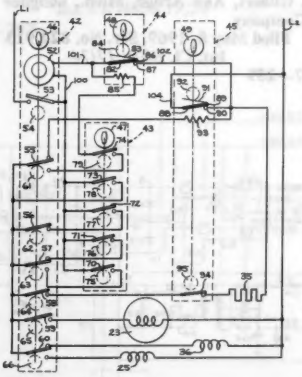



An electric fuel pump for a motor vehicle is provided with two modes of operation such that the pump will provide a high pressure at high flow rates in one mode of operation and a lower pressure at low flow rates in a second mode of operation.

## 3,600,602
## CONTROL ARRANGEMENT FOR A WASHING MACHINE

Johnny W. Yartz, Anchorage, Ky., assignor to General Electric Company

Filed Oct. 13, 1969, Ser. No. 865,799
Int. Cl. H01h 3/34
U.S. Cl. 307—141.8 7 Claims

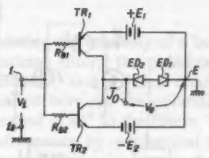


In an automatic washing machine, such as a dishwasher, having a timer control including cams for opening and closing predetermined combinations of switches whereby the electrical components of the machine are sequentially energized to provide an operational cycle, the circuit by which the motor of the timer control is energized is provided with at least two normally closed thermally responsive switches in series therewith. Each of the thermally responsive switches is adapted to be separately regulated manually and is arranged in the machine's circuitry such that, during a predetermined step of the machine's operational cycle, the motor circuit may be repeatedly interrupted to repeatedly halt the advancement of the timer control whereby the effective time duration of one or more of the electrical components operatively involved in the step is incrementally increased. Each of the thermally responsive switches is adaptively arranged in the circuitry to extend the effective operating time of those electrical components involved in a different specific step in the machine's operational cycle.

## 3,600,603
## TERNARY LOGIC CIRCUIT

Teruji Watanabe, Kitaadachi-gun, and Hideo Yamamoto, Sagamihara-shi, both of, Japan, assignors to Kokusai Denshin Denwa Kabushiki Kaisha, Tokyo-to, Japan

Filed Jan. 15, 1970, Ser. No. 3,080
Claims priority, application Japan, Jan. 20, 1969, 3517/69
Int. Cl. H03k 19/10, 19/08
U.S. Cl. 307—206 3 Claims

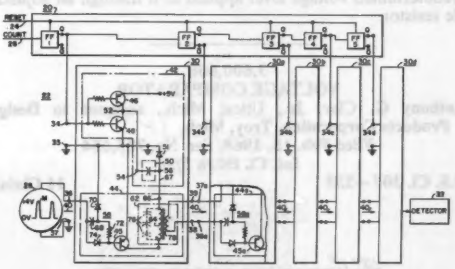


A ternary logic circuit, in which values of series-connected two controllable resistances to which plus potential and minus potential are respectively applied are controlled by a common input voltage. The output of the ternary logic circuit assuming one of three possible values in accordance with the value of the input voltage is obtained across a nonlinear load resistance connected across the ground and a junction between the two controllable resistances.

## 3,600,604
## FAILSAFE LOGIC GATES

George M. Thorne-Booth, Murrysville, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Dec. 3, 1968, Ser. No. 780,662
Int. Cl. H03k 19/22
U.S. Cl. 307—218 15 Claims




A novel electronic switching circuit is operated as an AC enable gate circuit which is adaptable to perform diverse functions in which failsafeness is desired. These functions include logic gating in binary data signal systems and interlocking relay functions in safety monitoring systems. The switching circuit construction yields an enable gate circuit operation mode which relies upon two dynamic signals to thereby provide virtually total failsafeness. The gate switching is performed by actuating an active amplifying device between its ENERGIZED and DEENERGIZED states to provide the OPEN and CLOSED enable gate circuit conditions, respectively. A gate actuation signal input network of the circuit derives the device energizing signal in response to a dynamic actuation signal, which is one of the dynamic

signals relied upon for failsafe properties. The enable gate channel of the circuit is of a construction which passes only a dynamic, or AC carrier signal above a predetermined threshold. The carrier signal is the other of the dynamic signals relied upon for failsafe properties. The AC carrier is amplified and then attenuated in its passage through the enable gate channel to cooperate with a thresholding in other circuits which may be connected in cascade.

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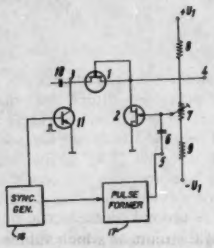
**3,600,605**

## CIRCUIT FOR MULTIPLYING TWO ELECTRICAL SIGNALS

**Klaus Lehmann, Nieder-Ramstadt, Germany, assignor to Fernseh GmbH, Darmstadt, Germany**

**Filed June 26, 1969, Ser. No. 838,049**
**Claims priority, application Germany, June 29, 1968, P 17 62 514.8**
**Int. Cl. G06g 7/12, 7/16**
**U.S. Cl. 307—229** **12 Claims**




A circuit for multiplying two electrical signals for use particularly in television. Two field-effect transistors are interconnected with their drain-source paths to form a voltage divider. The video signal is applied to one field-effect transistor, by way of a capacitor and clamping transistor. The gate of this one field-effect transistor is connected to the junction of the two field-effect transistors which serve, at the same time, as the output of the circuit for providing the product of the two electrical signals. The second signal to be multiplied to the video signal is applied to the gate of the other field-effect transistor which has simultaneously a predetermined voltage level applied to it through an adjustable resistor.

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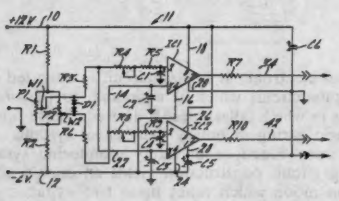
**3,600,606**

## VOLTAGE COMPARATOR

**Anthony G. Clor, Jr., Utica, Mich., assignor to Design Products Corporation, Troy, Mich.**

**Filed Feb. 15, 1968, Ser. No. 705,654**
**Int. Cl. H03k 5/20**
**U.S. Cl. 307—235** **11 Claims**



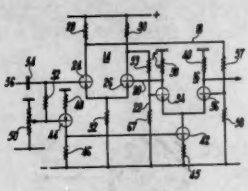
A voltage comparator providing an indication of a voltage balance and separate indications of unbalance on either side of balance.

**3,600,607**

## GATE DEVICE TRIGGERED FOR PASSAGES THROUGH ZERO

**Robert Vatin, Ivry, France, assignor to Commissariat A L'Energie Atomique, Paris, France**

**Filed Dec. 3, 1968, Ser. No. 780,655**
**Claims priority, application France, Dec. 14, 1967, 132278**
**Int. Cl. H03k 5/20**
**U.S. Cl. 307—235** **3 Claims**



A gate device has two stable states and a variable threshold voltage utilizing the properties of the differential amplifiers. Two transistors having the same emitter circuit have their collectors connected through a resistor to a point brought at a constant potential. The device is of the type in which the initial input voltage and the input voltage establishing the first stable state are equal and has two transistorized amplifiers, a main amplifier and an additional amplifier and two resistor circuits connecting respectively the first and second stages of the main amplifier to the second and first stages of the additional amplifier. A transistorized amplifier supplies a current proportional to the threshold voltage to the additional amplifier. A direct connection is made between one end of the load resistor of the first stage of the additional amplifier and the input of the second stage of the main amplifier, the voltage drop across said load resistor being equal to the difference between the input voltages for which the first and second stable stages are established.

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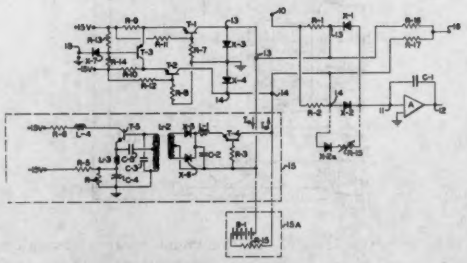
**3,600,608**

## HIGH SPEED LOW-OFFSET ELECTRONIC SWITCH FOR ANALOG SIGNALS

**Edward O. Gilbert, Ann Arbor, Mich., assignor to Reliance Electric Company**

**Filed May 8, 1969, Ser. No. 822,913**
**Int. Cl. H03k 17/74**
**U.S. Cl. 307—259** **15 Claims**



An electronic switch in which an analog input signal is applied to an output terminal through two oppositely-poled diodes and a circulating current from a floating current source is circulated through the two diodes so that the effects of their forward voltage drops on the switched current tend to cancel each other. To open the switch the circulating cur-

rent is diverted from the two diodes and they are reverse-biased by the forward drops across a further pair of diodes.

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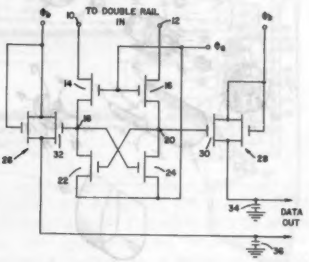
3,600,609

## IGFET READ AMPLIFIER FOR DOUBLE-RAIL MEMORY SYSTEMS

Alton O. Christensen, Houston, Tex., assignor to Shell Oil Company, New York, N.Y.

Filed Feb. 3, 1970, Ser. No. 8,208
Int. Cl. H03k 3/26; G11c 11/40
U.S. Cl. 307—279 6 Claims




A pair of cross-coupled IGFET devices connected in a race mode are combined with IGFET inverters to convert a differential double-rail output of an IGFET memory circuit into a full-logic-level double-rail data output.

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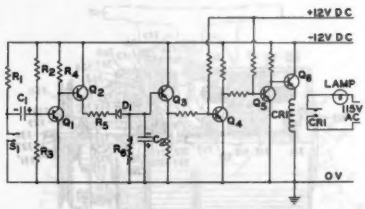
3,600,610

## TIME DELAY CIRCUIT FOR A RADIANT ENERGY PROTECTIVE APPARATUS

Robert J. Kelsch, Penfield, and Paul F. Schmitt, Walworth, both of, N.Y., assignors to Xerox Corporation, Rochester, N.Y.

Division of Ser. No. 596,281, Nov. 22, 1966, Patent No. 3,495,904. Filed July 9, 1969, Ser. No. 862,555
Int. Cl. H03k 17/28
U.S. Cl. 307—293 2 Claims



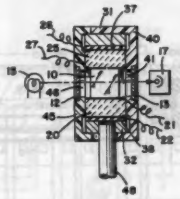

This invention relates to document motion detention devices and, more particularly, to protection of original documents from burning or tearing in graphic information scanning and transporting systems. A time delay circuit is provided wherein a switch is continuously energized and deenergized to control the operation of associated circuitry for the external control of a lamp or other control circuitry. If this switch remains opened or closed for a length of time due to a malfunction within the external control circuitry, the time delay circuit would deenergize said external circuitry to prevent damage to said original documents.

3,600,611

## ELASTO-OPTIC DEVICE WITH MECHANICAL BIAS

Richard W. Treharne, Xenia, Ohio, assignor to Kettering Scientific Research, Inc., Yellow Springs, Ohio

Filed Mar. 18, 1970, Ser. No. 20,527
Int. Cl. H01v 7/00; G02f 1/24
U.S. Cl. 310—8.2 7 Claims



A device for modulating the intensity of a beam of light includes a pair of polarizing filters, the polarization plane angles of which are crossed, and a fused quartz light transmitting element mounted between the polarizing filters with its preferred axis oriented at 45° to the filters. The element is made to exhibit birefringence by mechanical stress imposed by a piezoelectric device mechanically attached to one side of the element. A second piezoelectric device is attached to the other side of the element, and supplies an output to control the frequency of an oscillator circuit to maintain the frequency of oscillation of the assembly at resonance. The light transmitting element and the piezoelectric devices are mounted in a metal ring which is provided with an adjustment so that mechanical force may be applied to the element through the piezoelectric devices to bias the element thereby producing a quarter wave retardation which improves the efficiency of the device.

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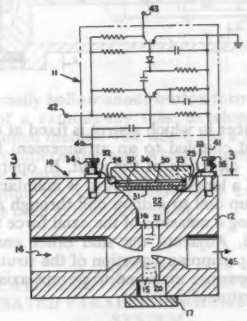
3,600,612

## TRANSDUCER

Basil B. Beeken, New Haven, Conn., assignor to Pitney-Bowes, Inc., Stamford, Conn.

Filed Mar. 27, 1970, Ser. No. 23,262
Int. Cl. H04r 17/00
U.S. Cl. 310—8.2 3 Claims

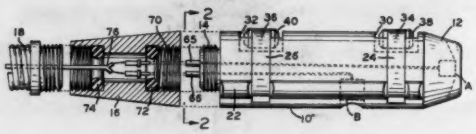


Transducing of a fluidic signal to an electric signal is accomplished in two steps by causing the fluidic signal to operate a whistle and then directing the resultant acoustical energy against a piezoelectric crystal that in sympathetically vibrating produces a low voltage output signal which can be used to control a suitable amplifying and rectifying electric circuit.

## 3,600,613
## TRANSDUCER PROBE FOR ULTRASONIC PULSE-ECHO TEST APPARATUS

William F. Clarke, Stamford, Conn., assignor to Branson Instruments, Incorporated, Stamford, Conn.

Filed Aug. 22, 1968, Ser. No. 754,648
Int. Cl. H01v 7/00; H04r 17/00
U.S. Cl. 310—9.1 1 Claim

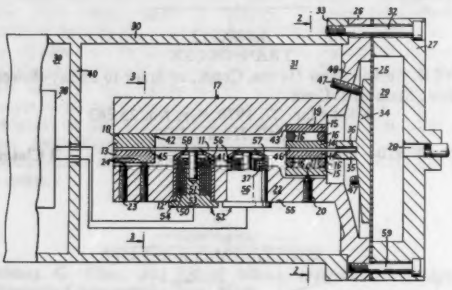


A transducer probe for ultrasonic pulse-echo testing comprises a generally circular elongated body adapted to be inserted into a tubing for being rotated and moved axially during test. The probe mounts one or more ultrasonic transducers and is provided with a set of fixed projections and a set of radially pivotable arms adapted to expand or retract to accommodate changes in tube diameter. In this manner the angle of incidence of the ultrasonic energy impinging on the tube is maintained substantially constant.

## 3,600,614
## FORCE TRANSDUCER WITH ELONGATE VIBRATING MEMBER

Ian F. M. Curtis, Farnborough, England, assignor to The Solartron Electronic Group Limited, Farnborough, England

Filed Nov. 10, 1969, Ser. No. 875,391
Claims priority, application Great Britain, Nov. 18, 1968, 54706/68
Int. Cl. H02k 35/00
U.S. Cl. 310—25 21 Claims



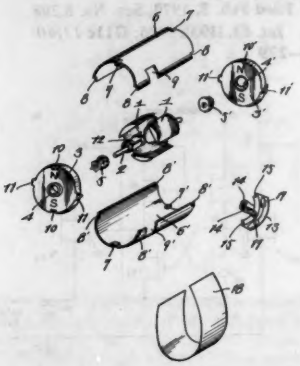
A force transducer in which a strut is fixed at one end and has the other end coupled to an arrangement for applying force in the axial direction of the strut. In operation, transverse vibration of a length of the strut is maintained by feedback from a pickup coil to a drive coil through an amplifier, the frequency being a measure of the axial force to which the strut is subjected. Adjacent the said other end a node is formed by a clamp gripping a portion of the strut. This clamp includes rolling bearings arranged to permit axial movement of the gripped portion of the strut.

## 3,600,615
## MINIATURE MOTOR

Tarou Morita, 6, 2-Chome, Gotenhama, Otu-shi, Japan

Filed Jan. 19, 1970, Ser. No. 3,878
Int. Cl. H02k 15/02
U.S. Cl. 310—40 3 Claims

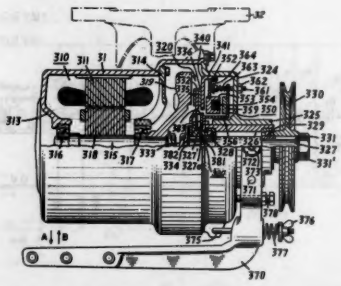
A miniature motor for moving toys comprising a rotor, a shaft on said rotor is fixedly mounted for rotation therewith, a rectifier element fixedly mounted on said rotor shaft, a pair of supporting discs made of permanent magnets for rotatably supporting said rotor shaft, a pair of semicircle section magnetic cover members surrounding said rotor in a peripherally spaced relation thereto and held in position on said supporting discs by the magnetic attraction force of said supporting discs and mechanical means, said cover members having mating notches at the adjacent side edges to define an opening, a brush holder fitted in said opening and having a pair of brushes to pinch said rectifier element therebetween an adhesive tape applied around the periphery of said pair of cover members to secure the cover members together.



## 3,600,616
## CLUTCH MOTOR WITH ELECTROMAGNETICALLY OPERATED AUXILIARY BRAKING MEANS

Masahiro Yokoyama, Nagoya, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed July 29, 1969, Ser. No. 845,856
Claims priority, application Japan, Aug. 1, 1968, 43/54,568
Int. Cl. H02k 7/112
U.S. Cl. 310—76 5 Claims

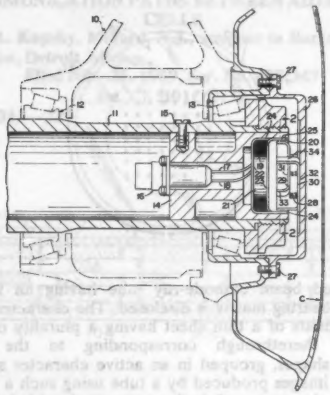


Upon stopping an output shaft driven by an electric motor, a clutch is driven into the partly clutched mode of operation through energization of electromagnets. An auxiliary brake disposed on the shaft is also operated by the electromagnets to maintain that mode of operation stable. The electromagnets respond to the associated load being at its predetermined position to be deenergized to stop the shaft and therefore the load at that position.

## 3,600,617
## PULSE GENERATOR

Theodore Frayer, North Canton, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Jan. 21, 1970, Ser. No. 4,552
Int. Cl. H02k *21/16*
U.S. Cl. 310—156 5 Claims

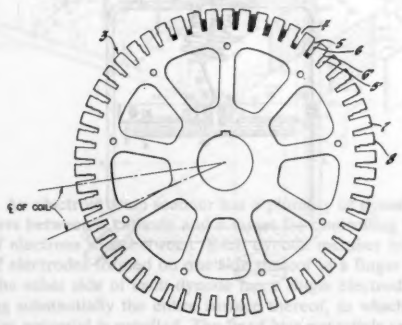


An electrical pulse generator comprising a fixed coil with an odd number of sets of pole piece fingers thereon is provided in association with a rotatable magnet having a different odd number of sets of pole piece fingers thereon and extending therefrom for operative association with and rotation by the pole piece fingers extending from the coil for creating pulses therein as a wheel in which the magnet is usually positioned is rotated.

## 3,600,618
## WOUND ROTOR ALTERNATOR COIL SLOT CONSTRUCTION

Gordon J. Nicholas, Naperville, and Edward P. Kupka, LaGrange, both of, Ill., assignors to General Motors Corporation, Detroit, Mich.

Filed Oct. 27, 1969, Ser. No. 869,533
Int. Cl. H02k *1/06*
U.S. Cl. 310—216 3 Claims

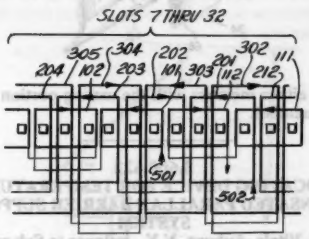



A lamination for a dynamoelectric machine wherein the slots include a pair of sides, one of which sides is straight and the other of which is stepped. The slots are so designed to receive a prewound coil.

## 3,600,619
## STATOR WINDING

Roger C. Tiarks, West Allis, Wis., assignor to Lincoln Tool & Manufacturing Co., Milwaukee, Wis.

Filed June 5, 1970, Ser.No. 43,664
Int. Cl. H02k *3/00*
U.S. Cl. 310—180 15 Claims



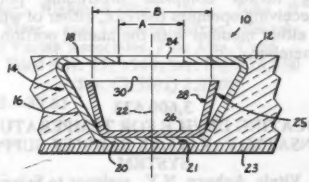

A stator winding includes three simultaneously wound winding patterns which are angularly spaced at 40°. Each winding pattern includes a series of 12 alternately oppositely wound coils in lapping relation to coils in the other two patterns, which coils all have a uniform span of 30°.

Also disclosed herein is a method of producing the first mentioned stator winding.

## 3,600,620
## ANODE BUTTON FOR PREVENTING LEAKAGE OF X-RADIATION

Edward C. Slick, Warren, and Floyd H. West, Sugar Grove, both of, Pa., assignors to Sylvania Electric Products Inc.

Filed July 13, 1970, Ser. No. 54,192
Int. Cl. G21f *3/00*; H01j *5/32*, *5/52*
U.S. Cl. 313—64 3 Claims




A substantially hollow anode button formed for sealing in a glass wall of a cathode-ray tube envelope has a radiation shield positioned therein. The shield has a bottom and an upstanding circumferential wall which extends to a height just less than the interior height of the button. The shield is free to move within the cup to allow easy exit of cleaning or rinsing fluids used in tube processing.

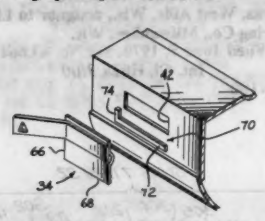
## 3,600,621
## LOCATING DEVICE FOR TEMPERATURE COMPENSATED PARALLAX BARRIER SUPPORTING SYSTEM

Benedict F. Vitale, Auburn, N.Y., assignor to Sylvania Electric Products, Inc.

Division of Ser. No. 786,183, Dec. 23, 1968.
Filed Nov. 20, 1970, Ser. No. 91,389
Int. Cl. H01j *29/02*, *29/06*, *31/20*
U.S. Cl. 313—855 1 Claim

Cooperating means formed between a temperature compensating member having an expansion loop and a sidewall of a parallax barrier are provided to insure centering of the loop within a preformed opening in the barrier sidewall. The

cooperating means comprise protruding portions and matching receiving openings therefor, either of which may be




formed on either member with the mating portion formed on the other member.

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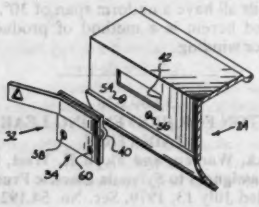
**3,600,622**
**LOCATING DEVICE FOR TEMPERATURE COMPENSATED PARALLAX BARRIER SUPPORTING SYSTEM**

**Benedict F. Vitale, Auburn, N.Y., assignor to Sylvania Electric Products Inc.**

Division of Ser. No. 786,183, Dec. 23, 1968.
Filed Nov. 20, 1970, Ser.No. 91,388
Int. Cl. H01j *29/06, 3/38*
U.S. Cl. 313—85 S 3 Claims




Cooperating means formed between a temperature compensating member having an expansion loop and a sidewall of a parallax barrier are provided to insure centering of the loop within a preformed opening in the barrier sidewall. The cooperating means comprise protruding portions and matching receiving openings therefor, either of which may be formed on either member with the mating portion formed on the other member.

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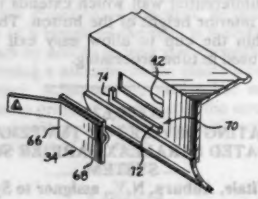
**3,600,623**
**LOCATING DEVICE FOR TEMPERATURE COMPENSATED PARALLAX BARRIER SUPPORTING SYSTEM**

**Benedict F. Vitale, Auburn, N.Y., assignor to Sylvania Electric Products, Inc.**

Division of Ser. No. 786,183, Dec. 23, 1968.
Filed Nov. 20, 1970, Ser. No. 91,390
Int. Cl. H01j *31/20*
U.S. Cl. 313—85 S 3 Claims

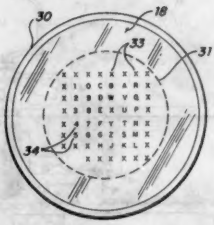



Cooperating means formed between a temperature compensating member having an expansion loop and a sidewall of a parallax barrier are provided to insure centering of the loop within a preformed opening in the barrier sidewall. The cooperating means comprise protruding portions and matching receiving openings therefor, either of which may be formed on either member with the mating portion formed on the other member.

**3,600,624**
**DISTORTION REDUCTION OF CHARACTER APERTURE MASK IN SHADED BEAM TUBES**

**Paul H. Gleichauf, La Jolla, Calif., assignor to Stromberg Datagraphix, Inc., San Diego, Calif.**

Filed Dec. 29, 1969, Ser. No. 888,437
Int. Cl. H01j *29/56, 31/16*
U.S. Cl. 313—86 1 Claim




A shaped beam cathode-ray tube having an improved character-bearing matrix is disclosed. The character shaping matrix consists of a thin sheet having a plurality of shaped apertures therethrough corresponding to the desired character shapes, grouped in an active character area. The quality of images produced by a tube using such a matrix is improved when a row of similar apertures is added surrounding the active character area. The areas and spacing of these outer apertures is important in achieving optimum distortion reduction.

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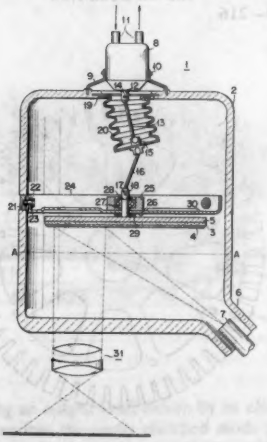
**3,600,625**
**PROJECTION PICTURE TUBE WITH ROTATING FLUORESCENT SCREEN**

**Asahide Tsuneta, Kawasaki-shi; Kuramatsu Hayakawa, Kawasaki-shi; Shinichi Sawagata, Tokyo, and Masao Ando, Kawasaki-shi, all of, Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki-shi, Japan**

Filed Aug. 26, 1969, Ser. No. 853,174
Claims priority, application Japan, Aug. 31, 1968, Oct. 17, 1968, 75008/68;90232/68
Int. Cl. H01j *1/44, 29/02, 7/24*
U.S. Cl. 313—149 6 Claims




A projection picture tube comprising an evacuated envelope, an electron gun assembly disposed therein, a metal target member with a fluorescent film thereon which is to be

scanned by electron beams emitted by the electron gun assembly, a motor for rotating the target member without causing the electron beams to be affected by an external magnetic field, and an optical system for enlarging the image produced on the fluorescent film.

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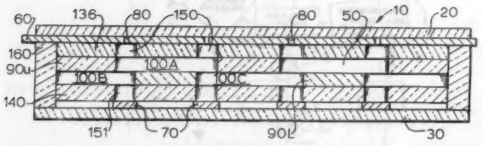
**3,600,626**

**MULTICELL DISPLAY DEVICE HAVING COMMUNICATION PATHS BETWEEN ADJACENT CELLS**

George A. Kupsky, Milford, N.J., assignor to Burroughs Corporation, Detroit, Mich.

Filed Nov. 26, 1969, Ser. No. 880,347
Int. Cl. H01j *61/30*
U.S. Cl. 313—220 2 Claims




A display panel having a plurality of gas-filled cells arrayed in rows and columns and having gas communication paths between adjacent cells formed by properly overlaying and offsetting plates having identical openings so that portions of corresponding openings form the cells and other portions form the gas communication paths between cells.

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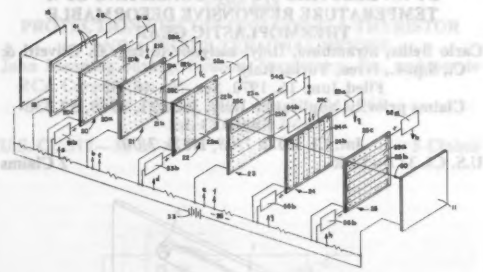
**3,600,627**

**ELECTRODE CONFIGURATION FOR ELECTRON BEAM SCANNER**

Walter F. Goede, Torrance, Calif., assignor to Northrop Corporation, Beverly Hills, Calif.

Filed Aug. 26, 1969, Ser. No. 853,172
Int. Cl. H01j *29/41*
U.S. Cl. 315—12 5 Claims



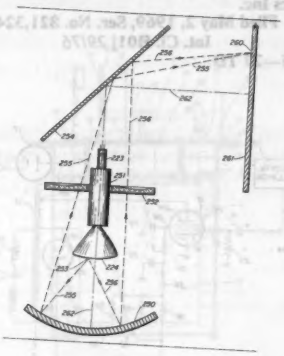
An electron beam scanner has a plurality of dynode members between a cathode and a target for controlling the flow of electrons therebetween. Each dynode member has a pair of electrodes formed on one side thereof in a finger pattern. The other side of each dynode has a single electrode covering substantially the entire surface thereof, to which a fixed bias potential is supplied. The fixed bias potentials applied to the dynodes are graduated from dynode to dynode between the cathode and the target. Means are provided to alternatively either forward or reverse bias each of the finger pattern electrodes with respect to its associated oppositely positioned fixed biased electrode, thus controlling the flow of electrons through each dynode.

**3,600,628**

**CATHODE RAY TUBE PROJECTION DISPLAY SYSTEM**

Charles R. Corpew, La Mesa, and Paul H. Gleichauf, La Jolla, both of, Calif., assignors to Stromberg Datagraphix, Inc., San Diego, Calif.

Continuation-in-part of application Ser. No. 694,686, Dec. 29, 1967, now Patent No. 3,473,077. This application Sept. 22, 1969, Ser. No. 859,978
Int. Cl. H01j *29/70*
U.S. Cl. 315—27 9 Claims



A display system using a cathode ray tube of the shaped beam type is disclosed. A Schmidt-type optical system is used to project an image from the tube face onto a large surface. In order to provide the desired projected image brightness and definition, a shaped beam tube having three electromagnetic deflection yokes positioned along the tube in a substantially unipotential region to accomplish aperture selection, beam convergence and beam realignment is provided.

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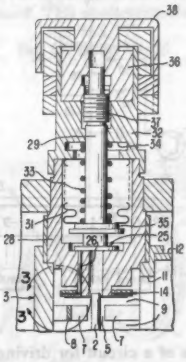
**3,600,629**

**TUNER FOR PROVIDING MICROWAVE CROSS-FIELD TUBES WITH AN EXTENDED TEMPERATURE STABILIZED FREQUENCY RANGE**

Paul Fenster, Highland Park, N.J.; John B. Horrigan, Beverly, Mass., and Leonard Safran, Beverly, Mass., assignors to Varian Associates, Palo Alto, Calif.

Filed Nov. 12, 1969, Ser. No. 875,850
Int. Cl. H01j *25/50*
U.S. Cl. 315—39.61 9 Claims




A rising-sun magnetron tube is disclosed employing a composite tuning ring structure axially translatable in an end space region adjacent the open ends of the anode resonators. The composite tuning ring includes a pair of conductive rings separated by a ceramic insulator. In a preferred embodiment

the conductive ring facing the anode circuit is disposed in axial registration with the back wall of the small anode resonators and has a radial width less than that of the other ring. The resultant tuner has increased tuning range and a more linear tuning rate to facilitate temperature compensation.

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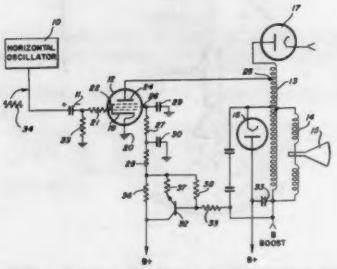
**3,600,630**

**HORIZONTAL OUTPUT TUBE PROTECTION CIRCUIT**

**Grigory Strachanow, Des Plaines, Ill., assignor to Warwick Electronics Inc.**

**Filed May 2, 1969, Ser. No. 821,324**
**Int. Cl. H01j** *29/76*
**U.S. Cl. 315—27 TD** **15 Claims**




The horizontal scan circuit for the cathode-ray tube of a television receiver having a horizontal power amplifier with a screen grid circuit including a transistor which is biased on by a signal from the horizontal scan circuit. If the input to the power amplifier fails, the bias signal is not present and the transistor turns off, limiting conduction by the power amplifier.

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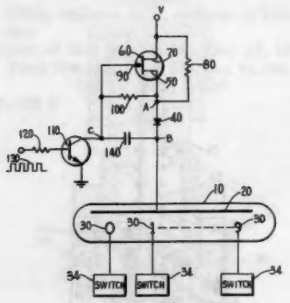
**3,600,631**

**OPTIONAL HIGH VOLTAGE BOOSTER CIRCUIT FOR INDICATOR TUBE**

**Arthur F. Cake, Orange, N.J., assignor to Burroughs Corporation, Detroit, Mich.**

**Filed July 2, 1968, Ser. No. 742,032**
**Int. Cl. H01j** *61/66;* **H02m** *7/52*
**U.S. Cl. 315—169 R** **2 Claims**



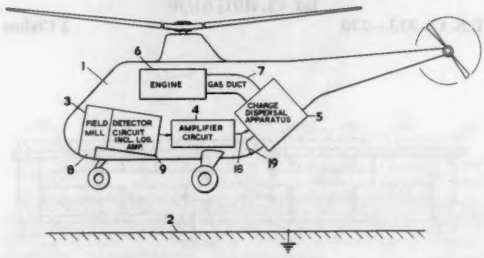

The disclosure is of a circuit for driving an indicator tube of the type including an anode and a plurality of glow cathode electrodes. The circuit includes a normal anode power supply and an auxiliary circuit for increasing the voltage supplied to the anode of the tube by a fractional amount of the voltage supplied by the normal power supply during periods when the normal power supply is insufficient to fire the tube.

**3,600,632**

**STATIC ELECTRICITY DISCHARGE SYSTEMS**

**Alfred William Bright, Southampton; Brian Makin, Botley; Michael Edward Rogers, Frimley, and Bruce Robert Whewell, London, all of, England, assignors to Minister of Technology in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England**

**Filed Dec. 2, 1969, Ser. No. 881,428**
**Claims priority, application Great Britain, Dec. 3, 1968, Nov. 12, 1969, 57433/68;55380/69**
**Int. Cl. H05f** *3/06*
**U.S. Cl. 317—2** **7 Claims**




Equipment for discharging static electricity from a structure comprises a transducer for measuring the magnitude and polarity of any electrostatic field developed at the surface of the structure, and charge-dispersal apparatus controlled thereby for ejecting electric charges in or on a stream of solid or liquid or frozen liquid particles of greater inertia than atmospheric gas ions. The particles may be formed by condensation in a fast-moving stream of vapor-containing gas. The gas stream may be formed in a duct having a throat and a widening expansion section downstream from the throat constructed so that the gas reached sonic speed at the throat and a speed from 1.3 to 2 times sonic speed in the expansion section. A voltage controlled by the transducer is applied to electrodes in the duct to cause a corona discharge in the gas stream. The invention may be used in aircraft, especially helicopters, and the gas stream may be provided through a duct from an engine of the aircraft.

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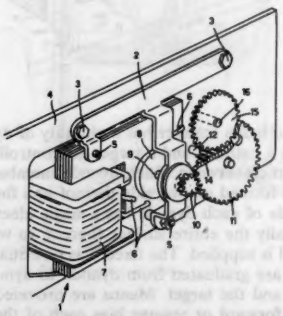
**3,600,633**

**SAFETY DEVICE FOR OFFICE MACHINES ACTUATED BY AN ELECTRIC MOTOR CONSISTING OF A TEMPERATURE RESPONSIVE DEFORMABLE THERMOPLASTIC GEAR**

**Carlo Bellis, Strambino, Italy, assignor to Ing. C. Olivetti & C., S.p.A., Ivrea, Turin, Italy**

**Filed June 16, 1970, Ser. No. 46,785**
**Claims priority, application Italy, June 21, 1969, 52,330-A/69**
**Int. Cl. H02h** *7/08;* **H02k** *7/00*
**U.S. Cl. 317—13 R** **2 Claims**



A safety device for electric office machines comprises a reduction gear train adapted to transmit the rotation of the

motor shaft to a main shaft of the machine, the gear train comprising a gear of thermoplastic material. When the motor is stalled and the rotor temperature rises, the temperature of the gear rises sufficiently rapidly to become plastic, thus allowing the motor to turn freely before real damage occurs thereto.

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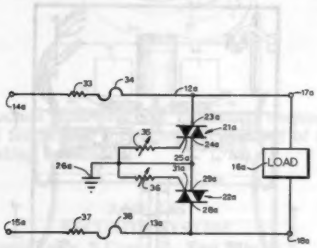
**3,600,634**

## PROTECTIVE CONTROL CIRCUIT AGAINST TRANSIENT VOLTAGES

**Charles A. Muench, Jr., Doraville, Ga., assignor to Integrated Systems, Inc., Norcross, Ga.**

**Filed Dec. 16, 1969, Ser. No. 885,485**
**Int. Cl. H02h** *3/22*
**U.S. Cl. 317—16** **10 Claims**




A load protective circuit using a pair of solid state gate controlled AC switches, each connected from one side of a transmission line to ground in order to shunt the load terminals of the load from overvoltages. In the first embodiment, a firing control resistor connected between the gate terminal of the triac and ground determines the firing voltage to be presented to the gate terminal when a transient occurs on the transmission line and thereby renders the triac conductive if the firing voltage exceeds the triac threshold voltage. In the second embodiment, the firing control resistor is a variable potentiometer by which the firing voltage applied to the gate terminal of the triacs may be varied to vary the overall protection firing voltage.

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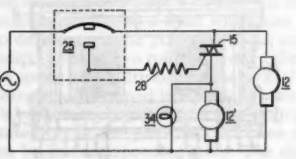
**3,600,635**

## PROTECTION CIRCUIT INCLUDING A THYRISTOR AND A THREE TERMINAL DEVICE

**John Manning Savidge Neilson, Norristown, Pa., assignor to RCA Corporation**

**Filed July 15, 1969, Ser. No. 841,766**
**Int. Cl. H02h** *3/08*
**U.S. Cl. 317—33 SC** **5 Claims**



A three terminal device containing a pair of mechanical contacts is placed in circuit with a thyristor and a load to be supplied; the mechanical contacts are adapted to respond to the current supplied to the load to determine the presence or absence of a triggering signal at the control electrode of the thyristor.

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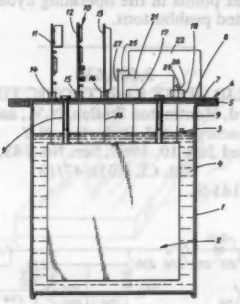
**3,600,636**

## ELECTRICAL APPARATUS COMPRISING A POWER SECTION AND A CONTROL SECTION WITH FLUID COOLING

**Tom Kastrup Petersen, Nordborg, Denmark, assignor to Danfoss A/S, Nordborg, Denmark**

**Filed Nov. 12, 1969, Ser. No. 875,876**
**Claims priority, application Germany, Nov. 14, 1968, P 18 08 887.4**
**Int. Cl. H05k** *7/20;* **H02b** *1/10*
**U.S. Cl. 317—100** **11 Claims**



The invention relates to an assembly of electrical apparatus which includes a power section and a control section. A container is provided for housing the power section and insulating cooling fluid for the power section. A cover plate of insulating material closes the top of the container and the control section is mounted on the cover plate. Holes are provided in the insulated cover plate with each hole being individually surrounded by a metal coating bonded to the insulating material. Connecting wires extend from above and/or below into the holes and each connecting wire terminates a short distance from the opposite side of its hole. Each connecting wire is soldered to the metal coating surrounding its hole to provide an electrical connection and to provide a fluidtight seal for the hole. Printed circuit means on the underneath side of the cover plate includes the metal coatings surrounding the hole to provide electrical interconnections between the soldered connecting wires.

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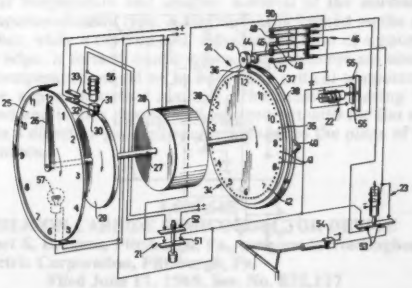
**3,600,637**

## ELECTRIC LOCK

**Helge Bertil Bergkvist, Nordanla, Beottby, Sweden**

**Continuation-in-part of application Ser. No. 500,578, Oct. 22, 1965, now abandoned. This application Sept. 10, 1968, Ser. No. 758,777**
**Int. Cl. E05b** *49/00*
**U.S. Cl. 317—134** **13 Claims**



An electric lock operating an actuator in response to a sequence of electric signals supplied at predetermined points

in an operating cycle. A switching device serves to direct signals supplied at the predetermined points in the operating cycle to a first relay device and to direct signals supplied at any other point to a second relay device. If the first relay device receives signals in accordance with the predetermined sequence, it operates in steps—each corresponding to one signal—to close or otherwise operate a control circuit of the actuator. If the second relay device receives a signal at any point in the operating cycle, it prevents the first relay device from closing or operating the control circuit for the remainder of the operating cycle. A presettable signal transmitter is provided which, after preselected pushbuttons have been depressed, can be set in operation to automatically supply signals at points in the operating cycle corresponding to the preselected pushbuttons.

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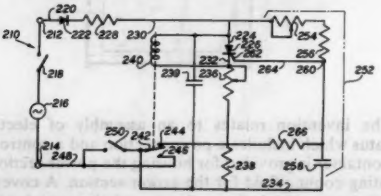
**3,600,638**

## SOLID STATE ELECTRONIC TIMER

**Robert H. Ward, Huntington Station, N.Y., assignor to Tempo Instrument Incorporated, Plainview, N.Y.**

**Filed July 10, 1968, Ser. No. 743,766**
**Int. Cl. H01h *47/18***
**U.S. Cl. 317—141 S** **2 Claims**



A control circuit for controlling the operation of a relay including an SCR connected between a pair of terminals which, in turn, are adapted to be connected across a source of potential. A relay is connected with the SCR so that the conduction of the SCR causes the relay to change states. Time delay means is connected to the control electrode of the SCR so that the SCR begins to conduct after the time delay means has been operated for a preselected interval of time thereby to provide a specific time interval before the relay changes state.

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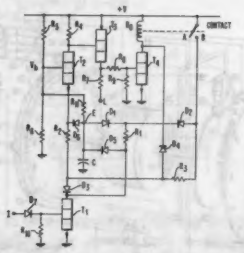
**3,600,639**

## RELAY DRIVER WITH AUTOMATIC TIME DISTORTION COMPENSATION

**Jean Claude Grange, Cagnes sur Mer, and Philippe Henri Hernandez, Nice, both of, France, assignors to International Business Machines Corporation, Armonk, N.Y.**

**Filed Aug. 24, 1970, Ser.No. 66,369**
**Claims priority, application France, Sept. 16, 1969, 6932232**
**Int. Cl. H01h *47/32***
**U.S. Cl. 317—148.5 R** **6 Claims**



In combination with a relay, a driving circuit in which the relay drop in and drop out times are made equal in response to abrupt and correspondingly occurring changes of input signal level. An arrangement of active sensing and biasing elements delays the actual opening or closing of the relay by charging up a capacitor to different predetermined levels and requiring the change of state to occur well within the capacitor charging times independent of the initial closure state.

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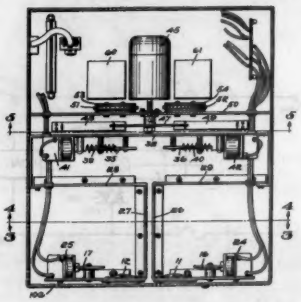
**3,600,640**

## CONTROL CIRCUIT FOR A VISION TESTING DEVICE

**Philip W. Johnston, Wellesley, Mass., assignor to Tracor, Inc., Austin, Tex.**

**Division of Ser. No. 636,500, May 5, 1967, abandoned.**
**Filed Mar. 25, 1969, Ser. No. 832,521**
**Int. Cl. H01h *47/28*; A61b *3/02***
**U.S. Cl. 317—149** **4 Claims**



A device for viewing a programmed sequence of displays through first and second fields of vision on a rotatable disk controlled by a motor, ratchet and timing device, the displays being a sequence of symbols assuming one of two possible orientations and of a size ascertainable by a person with normal vision. A movable lens arrangement is included for distorting the person's vision while viewing a short subsequence to test for farsightedness. Movable shutters alternately block each eye during the test. Symbols viewable by both eyes simultaneously appear superimposed to a person of normal muscle control.

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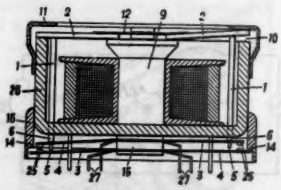
**3,600,641**

## ELECTROMAGNETIC PULSE COUNTER

**Herald Gessinger, Vienna, Austria, assignor to International Standard Electric Corporation, New York, N.Y.**

**Filed May 6, 1970, Ser. No. 35,121**
**Claims priority, application Austria, June 18, 1969, 5747/69**
**Int. Cl. H01h *9/00, 51/08***
**U.S. Cl. 317—157** **16 Claims**



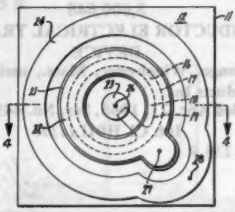
A miniature electromagnetic pulse counter is provided. The counter employs a circular configuration of armatures the one of which has been operated last moves the next one to be operated to an intermediate position. The next pulse will then cause operation of the next armature etc.

3,600,642

## MOS STRUCTURE WITH PRECISELY CONTROLLED CHANNEL LENGTH AND METHOD

David F. Allison, Los Altos, and Lewis K. Russell, Livermore, both of, Calif.

Filed Nov. 15, 1968, Ser. No. 776,069
Int. Cl. H01l 11/00; H01c 7/14
U.S. Cl. 317—235 2 Claims



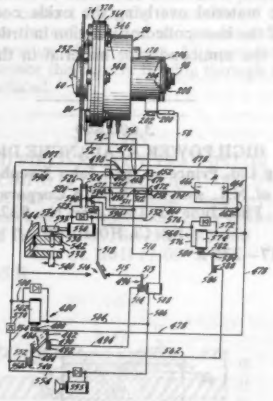
MOS structure with precisely controlled channel length and method for making the same by utilization of the same mask for making the channel.

3,600,643

## SECURITY SYSTEM

Arthur Marquis Losey, 8 Carey St., East Islip, N.Y.

Filed Dec. 4, 1968, Ser. No. 781,177
Int. Cl. E05b 49/00; H01h 27/00, 3/16
U.S. Cl. 317—134 7 Claims



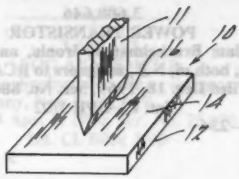
A security system in which maximum security is provided by obviating the use of keys and also by making operation by a trial and error technique or by detection devices impossible. In the disclosed embodiment a circuitry is in combination with a mechanism having a shaft which can be rotated by the user to different angular positions which are indicated by suitable indicia and has two rotors mounted thereon, each of which has a spring which drives a ratchet wheel only when its corresponding rotor is turned in a particular direction, the ratchet wheels each being engaged by a pawl spring which allows it to rotate only in the particular direction in which it may be driven by its corresponding rotor. The directions in which the ratched wheels may be rotated by the respective rotors are opposite and one of the wheels has all but one of its teeth electrically conductive so that a current passing from the rotor, its spring, and through its corresponding wheel and pawl spring will energize a time delay mechanism which will operate to prevent the actuation of a latch release mechanism unless that rotor is turned to bring the nonconductive tooth against the pawl spring, the other wheel having all but one of its teeth nonconductive so that rotation of the rotor to bring the conductive tooth against a corresponding pawl spring allows current to pass from that rotor and wheel and through the associated pawl spring to a solenoid to energize a mechanism which will thereby permit actuation of the latch release mechanism.

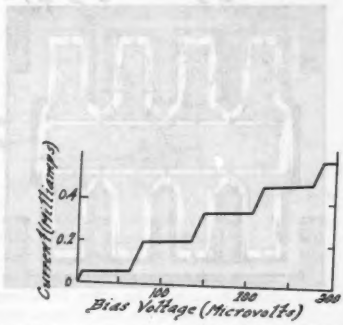
3,600,644

## SUPERCONDUCTOR-NORMAL METAL CIRCUIT ELEMENTS EXHIBITING JOSEPHSON EFFECTS

Robert E. Eck, Costa Mesa, Calif., assignor to Ford Motor Company, Dearborn, Mich.

Filed Mar. 6, 1969, Ser. No. 804,891
Int. Cl. H01l 5/04, 9/08
U.S. Cl. 317—234 6 Claims




This disclosure relates to a low temperature circuit element exhibiting radio frequency or AC Josephson effects comprising a member constructed of metal capable of superconductivity at low temperatures and a second member constructed of a metal that is normal or nonsuperconductive. One of the members has a generally flat surface and the other has a tapered end either in the form of a point or a line positioned in contact with the flat surface.

The disclosure also relates to the method of constructing a low temperature circuit element which comprises taking a material exhibiting superconducting effects when cooled to a critical temperature and another material of the normal or nonsuperconductive type. A flat surface is formed on the one member, while a tapered end, either in the form of a point or knife edge, is formed on the other. The members are cooled to a temperature equal to or below the critical temperature of the superconductive material. The member having the tapered end is then moved into engagement with the flat surface in a direction generally perpendicular to the plane of the flat surface.

3,600,645

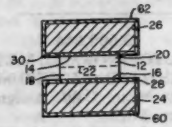
## SILICON CARBIDE SEMICONDUCTOR DEVICE

Herbert S. Berman, Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed June 11, 1969, Ser. No. 832,117
Int. Cl. H01l 3/00
U.S. Cl. 317—234 R 5 Claims

This disclosure relates to a silicon carbide device in which electrodes affixed to a wafer of silicon carbide are gold

plated. As a result of the gold plating of the electrodes, the device need not be hermetically sealed. In addition, the gold




plating operation provides a method of testing the device for leakage current.

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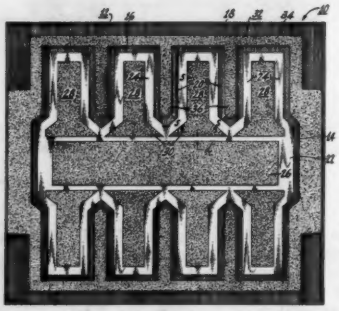
**3,600,646**

**POWER TRANSISTOR**

**Norbert William Brackelmanns, Ironia, and Joel Ollendorf, Springfield, both of, N.J., assignors to RCA Corporation**

**Filed Dec. 18, 1969, Ser. No. 886,293**
**Int. Cl. H01l *5/02***
**U.S. Cl. 317—234** **3 Claims**



A transistor with interdigitated emitter and base fingers, in which the emitter has a web portion for feeding current to the fingers, and metal layers on both the web and the fingers. The emitter finger metal layers are spaced from the web portion metal layers to introduce a ballasting resistance, with that portion of each finger metal layer proximate to the web portion being substantially wider than the remainder of the finger layer, and interspersed between the corresponding base finger and the emitter web portion to maintain a uniform distance between the base finger and the emitter finger metal layer.

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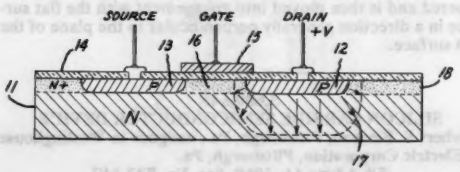
**3,600,647**

**FIELD-EFFECT TRANSISTOR WITH REDUCED DRAIN-TO-SUBSTRATE CAPACITANCE**

**Peter V. Gray, Scotia, N.Y., assignor to General Electric Company**

**Filed Mar. 2, 1970, Ser. No. 15,680**
**Int. Cl. H01l *11/00***
**U.S. Cl. 317—235** **6 Claims**




A field-effect transistor having reduced drain-to-substrate capacitance is described as comprising a semiconductor substrate having a region of substantially lower resistivity than the substrate in the vicinity of the drain electrode. The region of low resistivity is of comparable depth to the drain region and produces devices having low drain-to-substrate capacitance and a higher drain-to-source "punch-through" voltage breakdown.

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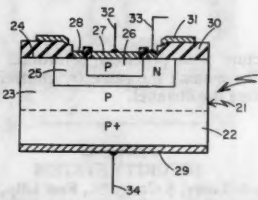
**3,600,648**

**SEMICONDUCTOR ELECTRICAL TRANSLATING DEVICE**

**Thomas A. Longo, Winchester, Mass., assignor to Sylvania Electric Products Inc.**

**Filed Apr. 21, 1965, Ser. No. 449,759**
**Int. Cl. H01l *11/06***
**U.S. Cl. 317—235 R** **3 Claims**




Double-diffused planar-type transistor having a layer of conductive material overlying the oxide coating protecting the edge of the base-collector junction in order to prevent inversion of the semiconductor material in the region of the junction.

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**3,600,649**

**HIGH POWER AVALANCHE DIODE**

**Shing-Gong Liu, Princeton, and John Joseph Risko, Cranbury, both of, N.J., assignors to RCA Corporation**

**Filed June 12, 1969, Ser. No. 832,654**
**Int. Cl. H01l *5/00***
**U.S. Cl. 317—235 R** **5 Claims**

A high power avalanche diode includes a substrate of N+-type semiconductor material having an epitaxial layer of a semiconductor material on a surface thereof. The epitaxial layer includes an N-type region adjacent the surface of the substrate and a P-type region over the N-type region forming a PN junction therebetween. The N-type region is at least 3 microns thick and is of uniform carrier concentration. The P-type region has a graded carrier concentration which increases from the PN junction to the surface of the epitaxial layer.

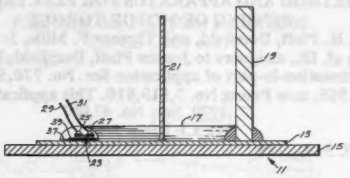
The avalanche diode is made by epitaxially forming a layer of N-type semiconductor material on the surface of a substrate of N+-type semiconductor material. A source of P-type dopant material is provided on the surface of the epitaxial layer. The P-type dopant material is diffused into the epitaxial layer to a distance which is spaced from the substrate not less than 3 microns and so as to provide the graded carrier concentration in the resultant P-type region.

3,600,650

## PROTECTED SEMICONDUCTOR DEVICE HAVING SENSOR THERMALLY COUPLED TO ELECTRODE

Robert E. Obenhaus, South Easton, and Lyle E. McBride, Jr., Norton, both of, Mass., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 30, 1968, Ser. No. 787,640
Int. Cl. H011 *11/00, 15/00*
U.S. Cl. 317—235 R 5 Claims



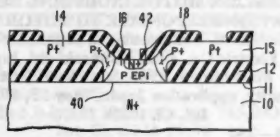
A semiconductor device has a sensor of thermistor material in thermally conductive contact with an electrode of the device at a surface common to the electrode and the sensor for intimate thermal sensing of the temperature of the electrode. Because of its small mass and intimate contact with the electrode, the sensor has a rapid thermal response (small time constant) relative to the rate of change of the device temperature so that the temperature of the sensor will essentially follow the temperature of the electrode without significant thermal lag. In a method of sensing the temperature of the device the sensor of thermistor material is placed in thermally conductive contact with the electrode of the device and the resistance thereof is sensed as a predetermined function of the temperature of the sensor. At a preselected temperature of the sensor the current flowing through the device is protectively reduced.

3,600,651

## BIPOLAR AND FIELD-EFFECT TRANSISTOR USING POLYCRYSTALLINE EPITAXIAL DEPOSITED SILICON

David M. Duncan, San Francisco, Calif., assignor to Fairchild Camera and Instrument Corporation, Long Island, N.Y.

Filed Dec. 8, 1969, Ser. No. 883,060
Int. Cl. H011 *11/00*
U.S. Cl. 317—235 R 7 Claims




Adjacent layers of single crystalline and polycrystalline semiconductor material are located upon a semiconductor substrate. The single crystalline layer provides for the active regions of a semiconductor device while the adjacent polycrystalline layers provide for lateral contacts to the active regions.

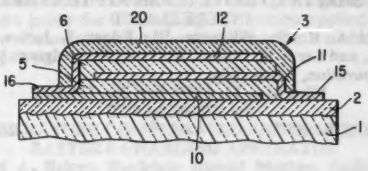
3,600,652

## ELECTRICAL CAPACITOR

Richard E. Riley, Mequon, Wis., assignor to Allen-Bradley Company, Milwaukee, Wis.

Filed Jan. 24, 1969, Ser. No. 793,822
Int. Cl. H01g *3/06*
U.S. Cl. 317—258 9 Claims

A dielectric material particularly suited for use in an electrical capacitor. The material has a constituent with particular metals combined with lead niobate. This constituent is dispersed in a ceramic matrix and can be readily deposited as a layer by screen printing techniques. The electrical capacitor may be supported on a substrate and may comprise more than one dielectric layer.

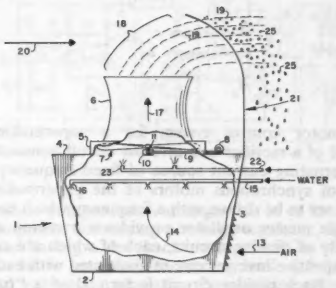



3,600,653

## FOG ABATEMENT

William A. Hall, Springfield, Pa., assignor to Atlantic Richfield Company, New York, N.Y.

Filed Apr. 2, 1970, Ser. No. 25,070
Int. Cl. B03c *3/00*
U.S. Cl. 317—262 R 8 Claims



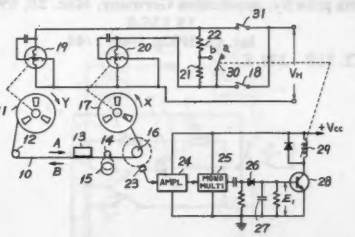

A method and apparatus for increasing visibility through fog by employing an electrical field to force liquid particles in the fog together to form large drops of sufficient mass to precipitate from the fog under the force of gravity.

3,600,654

## MAGNETIC TAPE SPEED CONTROLLING SYSTEM

Katsuya Yasutake, Yokohama-City, Japan, assignor to Victor Company of Japan Limited, Kanagawa-ku, Yokohama-City, Japan

Filed Aug. 12, 1969, Ser. No. 849,483
Int. Cl. H01j *9/22*
U.S. Cl. 318—6 7 Claims



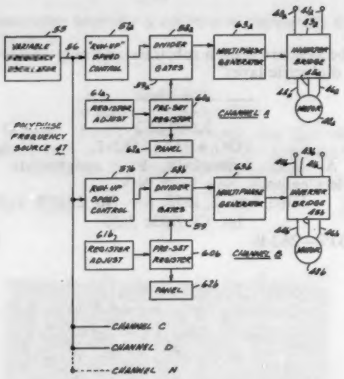

A system for controlling the running speed of a magnetic tape. The running speed of a magnetic tape is always controlled within a determined value by increase of reverse rotational torque of a reel motor of a tape supplying reel and back tension of the tape when the running speed of the magnetic tape exceeds the determined value during fast forwarding or rewinding of the tape.

3,600,655

## SYSTEM FOR CONTROLLING THE SPEED OF A PLURALITY OF MOTORS WHICH HAVE OUTPUT SHAFTS TO DRIVE ELEMENTS THAT ARE INTERRELATED

Richard A. Karlin, Wilmette, Ill.; Edgar J. Justus, Beloit, Wis., and Leroy H. Busker, Rockton, Ill., assignors to Beloit Corporation, Beloit, Wis.

Filed May 21, 1968, Ser. No. 730,825
Int. Cl. H02p 5/52
U.S. Cl. 318—67 26 Claims




A motor control system for a papermaking machine formed of a rectifier and inverter circuit connected between an alternating current source of fixed frequency and a plurality of synchronous motors of the papermaking machine which are to be driven with a frequency which can be varied. A single master oscillator provides a common source for a plurality of divider circuits, each of which are connected to the respective inverter circuit associated with each individual motor. Each divider circuit is formed of a "runup" speed control circuit which enables gradual increase of motor speed, a speed control logic circuit which provides a "draw" control between individual motors, and a polyphase generator to provide a polyphase voltage which is applied to the individual motors. Each speed control logic circuit is variable to control the speed of individual motors, and, consequently, the "draw" between the motors. The master oscillator is variable to control the speed of all motors jointly and concurrently.

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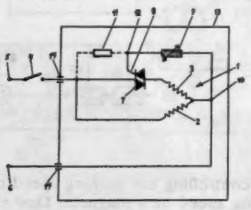
3,600,656

## STARTING MEANS FOR A SINGLE-PHASE ASYNCHRONOUS MOTOR

Asger Gramkow, Gammelgard pr. Augustenborg, Denmark, assignor to Danfoss A/S, Nordborg, Denmark

Filed Feb. 2, 1970, Ser. No. 7,890
Claims priority, application Germany, Mar. 25, 1969, P 19 15 135.0
Int. Cl. H02p 5/40, 1/44
U.S. Cl. 318—221 E 3 Claims



The invention relates to a starting switch assembly for a single phase asynchronous motor. The assembly includes a symmetrically controlled semiconductor valve in series with the motor starting coil. The control electrode of the valve is connected by way of a PTC resistor to the end of the starting coil which is remote from the valve. In this arrangement the PTC resistor is controlled directly by the power supply voltage and the time required for the PTC resistor to reach the cutout temperature depends substantially only on the characteristics of the PTC resistor and is independent of the particular construction of the motor.

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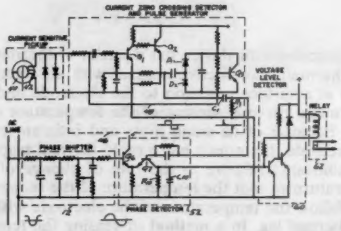
3,600,657

## METHOD AND APPARATUS FOR ELECTRONIC SENSING OF MOTOR TORQUE

Ernest H. Pfaff, Deerfield, and Thomas F. Mills, Jr., Chicago, both of, Ill., assignors to Jeanne Pfaff, Deerfield, Ill.

Continuation-in-part of application Ser. No. 720,554, Apr. 11, 1968, now Patent No. 3,518,810. This application June 17, 1970, Ser. No. 47,087
Int. Cl. H02p 5/42
U.S. Cl. 318—218 10 Claims




A circuit is provided for connection to an AC line and a reactive load which extracts a voltage wave form from the line, the phase of which is adjustable. A pickup to the load extracts a current wave form from the load on the line to the load and converts the current wave form to pulses which are synchronized with the zero crossing or points where the current goes to zero. A phase detector is connected to the voltage wave source and the current zero crossing pulse source and converts the signals to a DC analog output of the phase relationship between the voltage and current wave and this current is used to control by means of a voltage level operated switch, and an external circuit.

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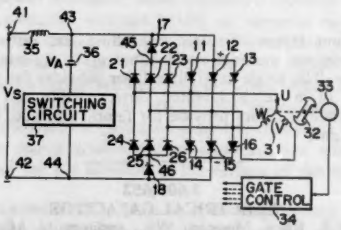
3,600,658

## BRUSHLESS MOTOR INCLUDING FORCED COMMUTATION RESPONSIVE TO ROTOR MOVEMENT

Masateru Kuniyoshi, Yokohama-shi, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Kawasaki-shi, Japan

Filed May 9, 1968, Ser. No. 727,961
Claims priority, application Japan, May 15, 1967, 30524/67
Int. Cl. H02k 29/00
U.S. Cl. 318—254 2 Claims




A brushless motor having substantially the same properties as those of a direct current motor and formed from a combination of thyristors included in a bridge inverter and a synchronous motor, wherein there is provided a diode bridge connected to the AC side of the inverter by means of Graetz connection for use as a bypass circuit for the back elec-

tromotive force occurring in the armature of the synchronous motor, and that there is also provided an auxiliary thyristor between the respective inverter buses and each of a pair of common contacts disposed opposite thereto thereby effectively to actuate the bypass circuit only at the time of commutation.

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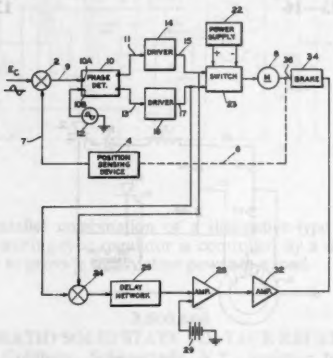
**3,600,659**

## SOLID-STATE COMPACT SERVOSYSTEM

**Alex Danchuk, Livingston, N.J., assignor to The Bendix Corporation**

**Filed Sept. 30, 1969, Ser. No. 862,208**
**Int. Cl. G05b** *5/01*
**U.S. Cl. 318—608** **2 Claims**




A servosystem having solid-state components includes means for summing an alternating command signal with a motor shaft position signal and when the resulting difference signal exceeds a predetermined threshold drivers are actuated for applying to the motor a voltage having a polarity in accordance with the phase of the difference signal relative to a reference. The voltage is cut off when the motor is at null, whereupon inertia drives the motor past null to provide a difference signal of opposite polarity so that the motor is driven in the opposite direction until it again passes through null, reversing the voltage thereto with the result being that full voltage is applied to the motor until the null is reached.

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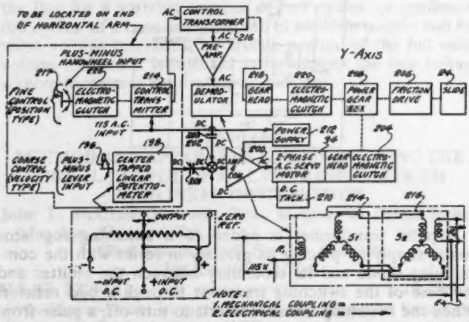
**3,600,660**

## ELECTRONIC CONTROL SYSTEM FOR A MULTIPLE AXIS PROBE FOR OBTAINING COORDINATE DATA FOR SURFACE POINTS ON A THREE-DIMENSIONAL SURFACE

**William A. Ford, Southfield, Mich., assignor to Ford Motor Company, Dearborn, Mich.**

**Filed July 16, 1968, Ser. No. 745,243**
**Int. Cl. G05b** *19/36*
**U.S. Cl. 318—578** **9 Claims**




A control system for a three dimensional surface probe used for measuring and recording the coordinates of points on a surface including a course adjustment feature and a fine adjustment feature whereby the probe may be steered by an operator over the surface, each adjustment feature includes operator-controlled electric motors and a probe position sensor in the probe for interrupting the motion applied to the probe by the motors when the probe reaches a surface contacting position.

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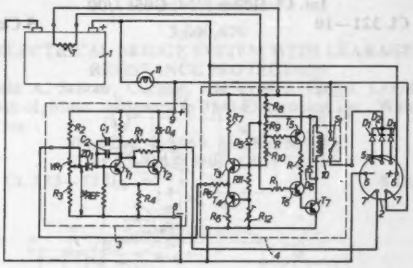
**3,600,661**

## TEMPERATURE COMPENSATED AND PROTECTED BATTERY CHARGING APPARATUS

**Leonard A. Briggs, Rayleigh; Harold Morton, Audenshaw, and Jan Swiderski, Preston, all of, England, assignors to Butec Limited, Preston, Lancashire, England and Oldham & Son Limited, Denton, Manchester, England**

**Filed Nov. 10, 1969, Ser. No. 875,163**
**Claims priority, application Great Britain, Nov. 11, 1968, 53443/68**
**Int. Cl. H02j** *7/14*
**U.S. Cl. 320—35** **9 Claims**



A temperature compensation arrangement in or for battery charging equipment embodying a voltage regulator, the voltage regulator having a feedback arrangement in which a potential divider is provided for feeding back a fraction of the regulated voltage for regulating the charging current applied to a battery. The temperature compensation arrangement is provided with two shunt paths for shunting the respective parts of the potential divider, the impedance of the shunt paths being made variable in dependence upon the temperature of a part of the equipment so that the fraction of the regulated voltage fed back varies with temperature.

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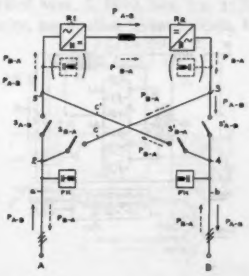
**3,600,662**

## POWER DIRECTION REVERSAL IN ASYNCHRONOUS MAINS COUPLINGS

**Elmar Anwander, Baden, Switzerland, assignor to Aktiengesellschaft Brown, Boveri & Cie, Baden, Switzerland**

**Filed Aug. 7, 1969, Ser. No. 848,222**
**Claims priority, application Switzerland, Aug. 9, 1968, 12,046/68**
**Int. Cl. H02m** *5/40*
**U.S. Cl. 321—4** **3 Claims**



An arrangement for effecting an exchange in the direction of power flow from one three-phase mains operating at one frequency to a second three-phase mains operating at a different frequency comprises a converter system intercon-

nected between and coupling the two three-phase mains together, the converter system including a rectifier of the semiconductor-type for converting the alternating current at the frequency of one of the mains to direct current and an inverter of the semiconductor type for converting the direct current back into alternating current at the frequency of the other mains. In order that diodes exclusively may be used in one converter, i.e. the rectifier, and thyristors exclusively used in, the other converter, i.e. the inverter, a system of cross-connections and switching means is utilized between the mains and the input and output sides of the converter so that the power is caused always to flow through the converter in the same direction regardless of the direction in which the power flows between the two mains.

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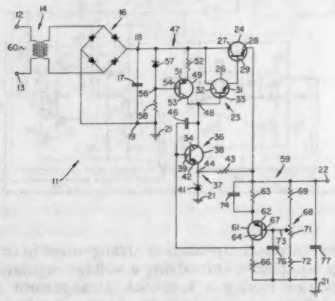
**3,600,663**

## VOLTAGE REGULATED POWER SUPPLY HAVING LOW RIPPLE FACTOR

**Ronald H. Wagner, Fremont, Calif., assignor to Ampex Corporation, Redwood City, Calif.**

**Filed July 31, 1969, Ser. No. 846,486**
**Int. Cl. H02m *1/14*; G05f *1/00***
**U.S. Cl. 321—10** **5 Claims**



A high-gain AC amplifier is coupled to amplify the AC signal components forming the ripple voltage superimposed on the regulated DC output voltage provided by a regulated DC power supply. The amplified AC signal components are coupled to the control electrode of a series pass voltage regulator of the power supply as an AC error signal to cancel AC signal components coupled thereto from a source of unregulated voltage serving as the primary power source.

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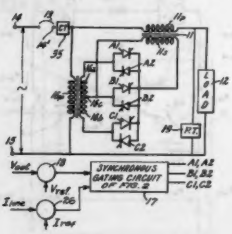
**3,600,664**

## OVERCURRENT PROTECTION FOR SOLID-STATE VOLTAGE REGULATOR

**Leon J. Goldberg, and Francois D. Martzloff, both of Schenectady, N.Y. assignors to General Electric Company**

**Filed Jan. 20, 1970, Ser. No. 4,246**
**Int. Cl. G05f *1/20, 1/30***
**U.S. Cl. 323—9** **9 Claims**




A solid-state voltage regulator constructed with low current rating step changing solid-state switches, or pairs of switches, is protected against overcurrents in the interval before the opening of a slow-acting circuit breaker. The overcurrent is transferred from one switch to another in sequence rapidly to take advantage of the short time current overcapacity, or is diverted to a shunting protective switch which can have other functions. Alternatively, one switch has a high current rating, and the overcurrent is diverted to the heavy-duty switch.

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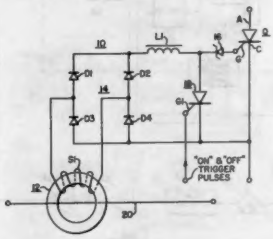
**3,600,665**

## FIRING CIRCUIT FOR GATE-CONTROLLED POWER SWITCHES

**Brian R. Pelly, Murrysville, and Richard H. Osman, Pittsburgh, both of, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.**

**Filed Sept. 30, 1969, Ser. No. 862,426**
**Int. Cl. G05f *3/00***
**U.S. Cl. 323—16** **13 Claims**




A firing control circuit comprised of a current source, a current-storage device responsive to current from the current source and a switching element which applies the stored current in the form of firing pulses to gate-controlled switches in response to ON-OFF conductive states determined by a timing pulse generator circuit.

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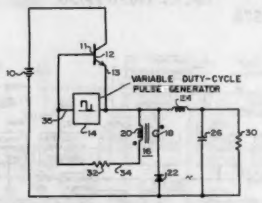
**3,600,666**

## SWITCHING REGULATOR POWER SUPPLY INCLUDING FAST TURNOFF MEANS FOR SWITCHING TRANSISTOR

**John H. Gliever, San Jose, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.**

**Filed Mar. 19, 1970, Ser. No. 21,116**
**Int. Cl. G05f *1/56***
**U.S. Cl. 323—22 T** **6 Claims**

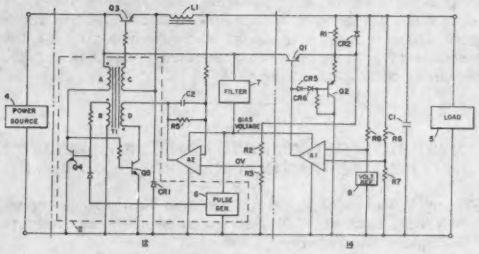



A pulse transformer is added to a switching regulator power supply by placing its primary in series with the commutating diode and its secondary between the emitter and the base of the switching transistor through a bias resistor. When the switching transistor starts to turn off, a pulse from the transformer helps turn off the switching transistor faster by removing the stored charge from the base, thus reducing power dissipation in the transistor.

### 3,600,667
### POWER SUPPLY HAVING PARALLEL DISSIPATIVE AND SWITCHING REGULATORS

William D. Wynn, Salt Lake City, Utah, assignor to The United States of America as represented by the Secretary of the Army

Filed Sept. 16, 1969, Ser. No. 858,399
Int. Cl. G05f 1/56
U.S. Cl. 323—22 T 1 Claim




The parallel combination of a dissipative-type regulator and a switching-type regulator is controlled by a differential amplifier to provide steady state power to a load.

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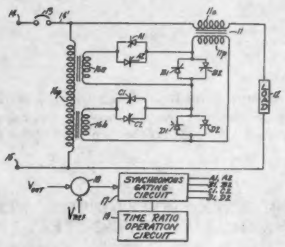
### 3,600,668
### TIME RATIO SOLID STATE VOLTAGE REGULATOR

Leon J. Goldberg, Schenectady, N.Y., assignor to General Electric Company

Filed Feb. 2, 1970, Ser. No. 7,790
Int. Cl. G05f 1/20, 1/30
U.S. Cl. 323—43.5 S 8 Claims




The solid state switches connected to fixed taps on a voltage-injecting transformer winding in a solid state step voltage regulator or load tap changing transformer are controlled synchronously to effectively insert the winding in series with the line for a variable number of half cycles, or preferably full cycles, of a base time interval. In addition to zero and full value voltage insertions, a variable portion of the full value voltage increment is injected in series with the line voltage without increasing the number of switches.

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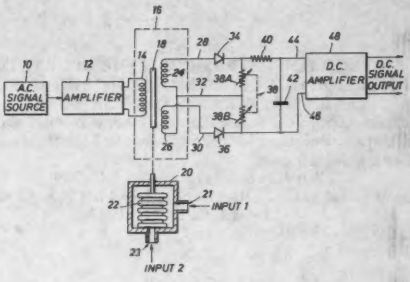
### 3,600,669
### METHOD AND APPARATUS FOR LINEARIZING THE SIGNAL OUTPUT OF AN LVDT RESPONSIVE TO NONLINEAR INPUT MOTION

John T. McClain, Houston, Tex., assignor to Daniel Industries, Inc., Houston, Tex.

Filed Sept. 8, 1969, Ser. No. 856,046
Int. Cl. H01f 21/06
U.S. Cl. 323—51 10 Claims

An improvement in methods and apparatus for linearizing the output of a linear voltage differential transformer responsive to a nonlinear input motion by utilizing a variable resistor disposed across the output of the secondary coils of the transformer for adjusting the magnitude of the difference signal to a predetermined value and reduce the error in the




signal to zero for a known displacement of the movable transformer core.

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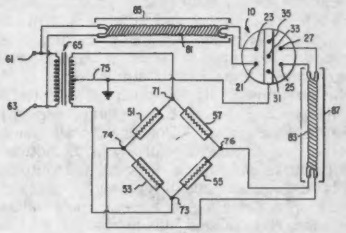
### 3,600,670
### ELECTRICAL BRIDGE SYSTEM WITH LEAKAGE-RESISTANCE PROTECTION

Donald A. Senour, Carlisle, and Fred J. Lingel, Lynnfield, both of, Mass., assignors to BLH Electronics, Inc., Waltham, Mass.

Filed Dec. 4, 1969, Ser. No. 881,998
Int. Cl. H01r 3/06; G01r 17/10
U.S. Cl. 323—75 D 4 Claims



The effects of leakage resistance in a precision measuring system are minimized by providing a guard strip for shielding the power input terminals from the low-level signal output terminals in an electrical connector, by grounding the center tap of the secondary of the power input transformer, and by both twisting and shielding the pairs of power input leads and signal output leads.

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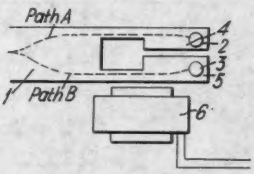
### 3,600,671
### METHOD FOR DETERMINING CONTACT CLOSING BEHAVIOR OF A BIFURCATED CANTILEVER SPRING

Royston Walter Bannister, Tunbridge, and Brian M. Lewis, London, both of, England, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Mar. 2, 1970, Ser. No. 15,746
Claims priority, application Great Britain, Mar. 7, 1969, 12224/69
Int. Cl. G01r 31/02
U.S. Cl. 324—28 R 2 Claims




An electrical testing procedure is shown for detecting whether a pair of bifurcated contacts close at the same time and, if not, which contact is closing first. Detection of con-

tact closing is accomplished by detecting alternating current caused magnetic fields adjacent the separate portions of the bifurcated contact arms.

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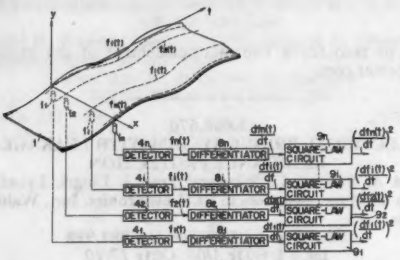
**3,600,672**

## METHOD FOR DETERMINING THE DEGREE OF ELONGATION OF ROLLED MAGNETIC METAL STRIPS AND AN APPARATUS FOR THE SAME

**Moritada Kubo, Tokyo, and Kuniji Asano, Kawasaki-shi, both of, Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki-shi, Japan**

**Filed July 8, 1969, Ser. No. 840,008**
**Claims priority, application Japan, July 12, 1968, 43/48459**
**Int. Cl. G01r *33/12***
**U.S. Cl. 324—34 R** **6 Claims**




A method for determining the degree of elongation of rolled magnetic metal strips and an apparatus for the same which comprises bringing automatic induction detectors close to one side of a travelling rolled magnetic metal strip to cause changes with time in the displacement of the metal strip in the direction of its thickness to be detected in the form of changes in inductance, supplying outputs from the detectors to one side of an AC bridge circuit, demodulating outputs from the bridge circuit by a demodulator, differentiating the values of the demodulated outputs by differentiators, and squaring the differentiated values by square-law circuits, and detecting the momentary values of the degrees of elongation of said metal strip, thereby controlling its rolled form.

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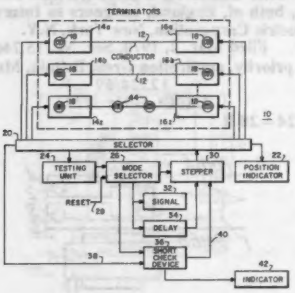
**3,600,673**

## SEQUENTIALLY STEPPED, TERMINATION INDICATING MULTI-CONDUCTOR CHECKING AND TESTING APPARATUS

**Stephen J. Kohke, Bridgewater Township, Somerset County, N.J., assignor to Thomas & Betts Corporation, Elizabeth, N.J.**

**Filed July 15, 1969, Ser. No. 841,943**
**Int. Cl. G01r *31/02***
**U.S. Cl. 324—51** **13 Claims**




An apparatus useful in the assembly and testing of the multiconductor cable assemblies which in a first mode of operation indicates the path for each conductor and indicates the path for each succeeding conductor only after such conductor has been properly terminated. In a second mode of operation a completed cable assembly may be checked out to determine whether each of its conductors properly extends between its desired terminators. In a further mode of operation each conductor may be checked against the remaining conductors of the cable assembly in order to insure absence of shorts between such conductors and the remaining conductors of the cable. Various indicators are provided to indicate the particular conductor under test, to indicate whether or not termination has been properly made and if a short exists. Further, test procedures built into the apparatus prevent the device from further functioning where conditions exist either due to a misterminated conductor or by the presence of a short between a selected conductor and the remaining conductors of the cable.

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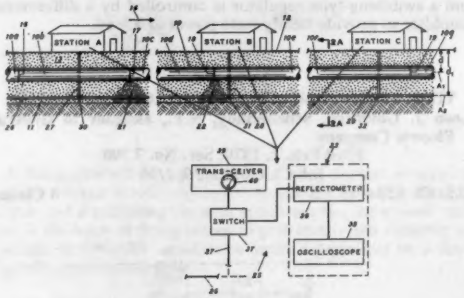
**3,600,674**

## METHOD OF DETERMINING LEAKS FROM BURIED PIPELINES USING A TIME-SHARING TRANSMISSION LINE

**Frederick Alexander Roberts, Brea, and Edwin B. Saunders, Whittier, both of, Calif., assignors to Chevron Research Company, San Francisco, Calif.**

**Filed Apr. 2, 1969, Ser. No. 812,676**
**Int. Cl. G01r *31/11*; G01m *3/16***
**U.S. Cl. 324—52** **9 Claims**




A method of determining leakage from a buried pipeline using a closed-loop radar system having time-sharing transmission line buried adjacent to the pipeline to be monitored.

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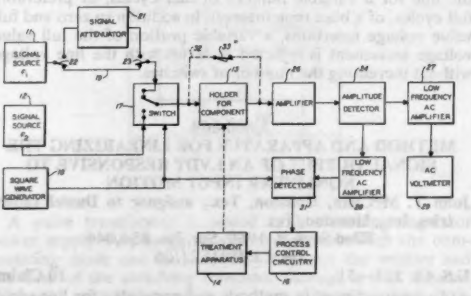
**3,600,675**

## METHOD AND SYSTEM FOR ADJUSTING ELECTRICAL COMPONENTS USING ALTERNATELY APPLIED SIGNALS

**Robert P. Grenier, Newburyport, Mass., assignor to Western Electric Company, Incorporated, New York, N.Y.**

**Filed Dec. 30, 1969, Ser. No. 889,211**
**Int. Cl. G01n *27/00***
**U.S. Cl. 324—57 R** **9 Claims**




A crystal filter or similar electrical component is adjusted by application to the filter of a characteristic adjusting medi-

um, such as evaporated or sputtered gold, in order to provide a desired differential insertion loss with respect to output signals corresponding to two input signals generated at two frequencies of interest. The two input signals are applied sequentially to the filter with the signal levels of the input signals calibrated to differ by a quantity equal to the desired differential insertion loss. An initial calibration, utilizing a signal attenuator, provides this differential. Treatment then occurs, with the output of the crystal being continuously monitored by a signal amplitude measuring device. An AC monitoring signal, representing the alternating output signal levels corresponding to the sequentially applied input signals, is generated from the signal amplitude measuring device. A phase reversal in the AC monitoring signal is sensed by a phase detector, which generates a control signal to terminate the treatment operation. The phase reversal occurs at the instant that the desired differential insertion loss value is attained.

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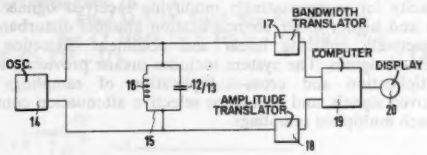
**3,600,676**

## MOISTURE METER UTILIZING AMPLITUDE AND BANDWIDTH SIGNALS

**Rainer Wolfgang Lugwig, Stuttgart-Feuerbach, and Herwig Max Jungmichel, Wilferdingen, both of, Germany, assignors to Horst Nauditt Roland Sirenenbau-Electronicschiffbau, Noettingen, Germany**

**Filed Mar. 21, 1969, Ser. No. 809,353**
**Int. Cl. G01r** *27/26*
**U.S. Cl. 324—61 R** **6 Claims**




There is disclosed a meter for measuring on a continuous basis the moisture content of a moving layer of bulk materials such as coal or wood chips. A capacitor has two plates on one side to span a portion of the conveyed bulk material with its field. This capacitor is connected in a resonant circuit which is frequency modulated with a sawtooth modulation wave varying about a particular center frequency which is predetermined for the dielectric constant provided to the capacitor by a known bulk material. Then the amplitude and bandwidth of the resonant circuit frequency response is a function of the moisture content and quantity of bulk material in the capacitor field. An analog computer then takes a ratio to produce a direct reading as a percentage of moisture content.

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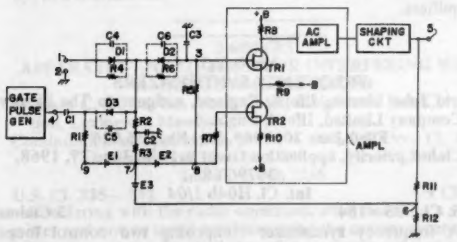
**3,600,677**

## WIDE BAND GATE CIRCUITS WITH FEEDBACK CIRCUITS

**Kozo Uchida, Tokyo, Japan, assignor to Iwatsu Electric Company, Ltd., Tokyo, Japan**

**Filed Mar. 26, 1969, Ser. No. 810,625**
**Claims priority, application Japan, Apr. 2, 1968, 43/21229**
**Int. Cl. G01r** *19/16;* **H03k** *17/00*
**U.S. Cl. 324—103 P** **10 Claims**




The wide band gate circuit with a feedback circuit comprises at least one series element including a first and a second diodes connected in series opposition, an input terminal connected to one end of the series element to receive a signal to be measured, an output terminal connected to the other end of the series element, a third diode connected to the junction between the first and second diodes to apply a gate pulse from a gate pulse generator to cause said signal to flow between input and output terminals and to prevent a portion of the input signal from being reflected by the gate pulse generator back to the input terminal, a condenser connected between the output terminal and the ground to store the amplitude of said signal, a shunt element including a large capacitance and connected between the ground and the junction between the first and second diodes so as to prevent a leakage signal from appearing on the output terminal, an amplifier connected to the output terminal, a shaping circuit to accumulate and maintain the peak value of the output from the amplifier and a feedback circuit to feedback at least a portion of the signal accumulated in the shaping circuit to all of the diodes.

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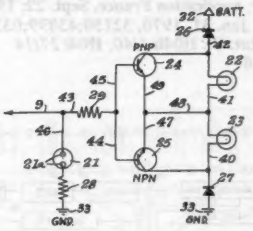
**3,600,678**

## SOLID-STATE POLARITY TESTER FOR TELEPHONE EQUIPMENT

**Jim C. Garrett, and Robert H. Johnson, both of 3300 East Spring St., Long Beach, Calif.**

**Filed Sept. 12, 1969, Ser. No. 857,368**
**Int. Cl. G01r** *19/14, 19/16*
**U.S. Cl. 324—133** **6 Claims**




A solid-state polarity tester provided with ground and battery terminals for connection to like contacts of a battery in a telephone central office switchroom, and with a probe to test polarity of telephone equipment, the same embodying two similar circuits between the probe and each respective terminal, each said circuit including an indicator lamp and a transistor that switches on to close the circuit through one lamp according to the direction of current flow, and shorting out the other lamp. The tester includes a third circuit between the probe and the ground terminal and including a glow tube energized to indicate either high-level DC or AC in contact with the probe.

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**3,600,679**

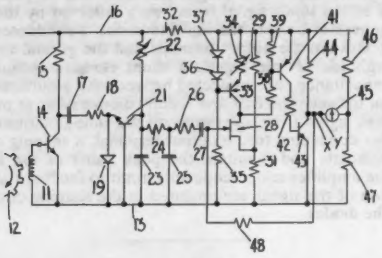
## MAXIMUM ACCELERATION OR DECELERATION METER FOR A ROAD VEHICLE

**William Frank Hill, Stafford, England, assignor to Joseph Lucas (Industries) Limited, Birmingham, England**

**Filed July 14, 1969, Ser. No. 841,255**
**Claims priority, application Great Britain, July 29, 1968, 36,026/68**
**Int. Cl. G01p** *3/42*
**U.S. Cl. 324—162** **1 Claim**

A meter for indicating the acceleration of a road vehicle has a speed-sensing means which produces an electrical signal representing the speed of the vehicle. This signal is then applied to a differentiating circuit, and the output from the differentiating circuit whereby the indicator reads the

maximum acceleration or the maximum deceleration depending on the position of the switch means is applied to an



indicator. The acceleration can be a positive acceleration or a negative acceleration.

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**3,600,680**

**FSK DEMODULATOR AND MODULATOR COMBINING DIFFERENTIATED COUNTED SIGNALS INTO A WEIGHTED ANALOG OUTPUT**

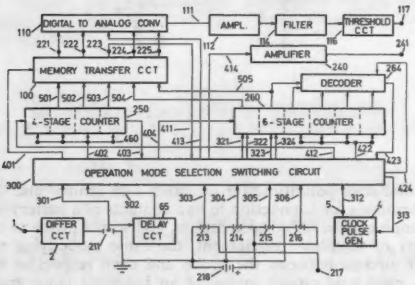
**Maurice A. Maniere, and Jacques K. Meile, both of Paris, France, assignors to Lignes Telegraphiques Et Telephoniques, Paris, France**

Filed Apr. 13, 1970, Ser. No. 27,711

**Claims priority, application France, Sept. 22, 1969, Dec. 18, 1969, Jan. 31, 1970, 32150;43899;03264**

**Int. Cl. H04b** *1/40;* **H04l** *27/14*

**U.S. Cl. 325—18** **9 Claims**




A demodulator for frequency-shift modulated telegraph signals using at least two different signal frequencies, comprising means for deriving from the received wave control signals corresponding to the passages through zero of said wave, means for deriving delayed signals from said control signals, a clock pulse generator having a frequency much higher than said frequencies, means for applying said pulses to a binary counter having a plurality of stages, means for resetting said counter to an initial state by said control signals, and logic circuits means including a storage type data-gating circuit controlled by said control signals and displaying the state of said counter in the form of a group of binary signals. The latter are combined into an analog signal which, after being amplified, is applied to a threshold circuit, and the signals appearing at the output of the latter circuit are applied to a utilization terminal. It is shown that a circuit for modulator operation may be obtained by combining most elements of the demodulator with a frequency divider for the pulse frequency and a decoder.

**3,600,681**

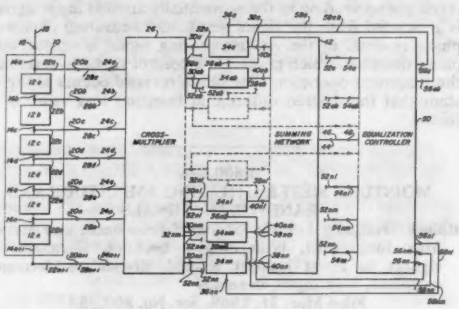
**NONLINEAR EQUILIZATION SYSTEM INCLUDING SELF- AND CROSS-MULTIPLICATION OF SAMPLED SIGNALS**

**Timothy Arbuckle, Montclair, N.J., assignor to Computer Modern Corporation, Fort Lee, N.J.**

**Filed Dec. 4, 1969, Ser. No. 881,964**

**Int. Cl. H04b** *1/12, 3/04*

**U.S. Cl. 325—42** **6 Claims**




A communication channel equalization system having capacity for compensatingly modifying received signals for first and higher order communication channel disturbances respectively inducing linear and nonlinear distortion in received signals. The system includes means providing self-multiplication and cross-multiplication of samplings of received signals, and means for selective attenuation control of such multiplied samplings.

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**3,600,682**

**MICROWAVE POWER AMPLIFIER NETWORKS INCLUDING SWITCHING ARRANGEMENTS THEREFOR**

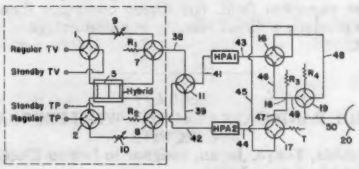
**Kouichi Yoshimoto, and Susumu Kitazume, both of Tokyo, Japan, assignors to Nippon Electric Company, Limited, Tokyo, Japan**

**Filed May 13, 1969, Ser. No. 824,059**

**Claims priority, application Japan, May 14, 1968, 43/32391**

**Int. Cl. H04b** *1/04*

**U.S. Cl. 325—168** **11 Claims**




Multiplex signals are interconnected to two high-power amplifiers with microwave switches and hybrids in an arrangement so that each amplifier can selectively handle the signals of the other amplifier in case of failure of one of the amplifiers.

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**3,600,683**

**FREQUENCY SYNTHESIZERS**

**David John Martin, Ilford, England, assignor to The Plessey Company Limited, Ilford, England**

**Filed June 20, 1969, Ser. No. 835,016**

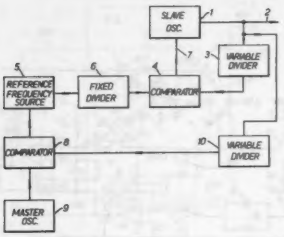
**Claims priority, application Great Britain, June 27, 1968, 30796/68**

**Int. Cl. H04b** *1/04*

**U.S. Cl. 325—184** **3 Claims**

A frequency synthesizer comprising two control loops wherein the frequency of a slave oscillator is coarsely controlled in accordance with the setting of a variable divider contained in one loop having a short time constant and

wherein fine frequency control is achieved in accordance with the setting of a further variable divider which is contained within the other loop having a long time constant




(narrow bandwidth) thereby to provide the advantages of wide tuning range associated with LC oscillators with the stability of a crystal oscillator.

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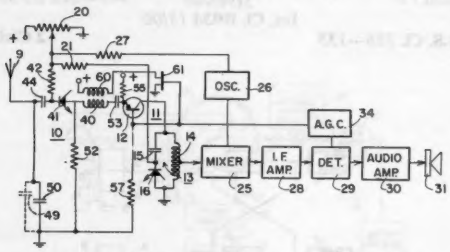
**3,600,684**

## OVERLOAD COMPENSATION CIRCUIT FOR ANTENNA TUNING SYSTEM

**James R. Cherry, Barrington, Ill., assignor to Motorola Inc., Franklin Park, Ill.**

**Filed May 15, 1969, Ser. No. 824,986**
**Int. Cl. H04b** *1/18;* **H03g** *3/30;* **H03j** *3/06*
**U.S. Cl. 325—319** **7 Claims**




As the RF signal supplied by an antenna to a varactor-tuned coupling circuit increases in magnitude, the impedance across an inductor in series with the varactor also increases due to the increased conductivity of an AGC-controlled field-effect transistor connected in the circuit of a secondary winding inductively coupled to the inductor. The system also is frequency sensitive, so that as the frequency of the RF signal applied across the inductor increases, the effective impedance also increases to compensate for increases of the reactance of the varactor diode at higher frequencies to maintain the RF signal level across the varactor diode at a level below that at which the diode rectifies the RF signals applied thereacross.

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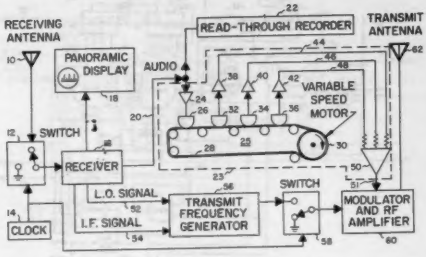
**3,600,685**

## APPARATUS AND METHOD FOR INTERFERING WITH RADIO COMMUNICATIONS

**William C. Doyle, Los Altos, Calif., assignor to Itek Corporation, Lexington, Mass.**

**Continuation of application Ser. No. 602,454, Dec. 13, 1966, This application Mar. 20, 1969, Ser. No. 809,053**
**Int. Cl. H04b** *1/36*
**U.S. Cl. 325—332** **9 Claims**

Interfering with the radio communication between a transmitter and one or more receivers using the communication itself to destroy the intelligibility of the communication to the intended recipient. The communication is intercepted during one portion of a duty cycle and delayed by various different amounts. Thereafter, the differently delayed communications are added to form an unintelligible signal which is transmitted during the other portion of the duty cycle for reception by the intended recipient.

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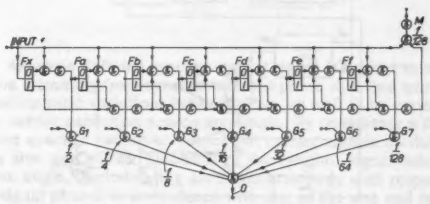
**3,600,686**

## BINARY PULSE RATE MULTIPLIERS

**James Richard Halsall, Reading, England, assignor to Imperial Chemical Industries Limited, London, England**

**Filed May 14, 1969, Ser. No. 824,580**
**Claims priority, application Great Britain, May 22, 1968, 24417/68**
**Int. Cl. H03k** *23/00*
**U.S. Cl. 328—38** **3 Claims**




This invention relates to a binary pulse rate multiplier for use in digital incremental control or instrumentation systems. Unlike known binary rate multipliers, the multiplier of the invention does not require any pulse shaping or differentiating circuits and comprises a plurality of bistable elements or flip-flops arranged to operate as a progressive binary or Gray code pulse counter, and means whereby the pulses arriving at the inputs to the bistable elements are routed to a combined output pulse line via individual pulse rate selection gates, so that energization of appropriate selection gates creates an output pulse train in the output pulse line having an average repetition rate which is a desired fraction of the average repetition rate of the input pulses applied to the counter by way of an input pulse line.

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**3,600,687**

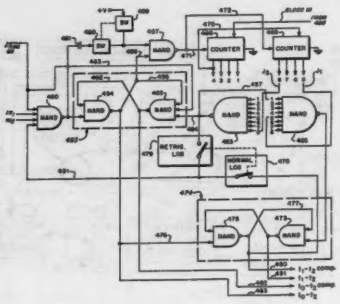
## LOGIC ONE-SHOT

**George J. Dusheck, Jr., Cinnaminson, N.J., assignor to The United States of America as represented by the Secretary of the Navy**

**Filed Jan. 3, 1969, Ser. No. 788,847**
**Int. Cl. H03k** *19/00*
**U.S. Cl. 328—63** **10 Claims**

A logic circuit for providing output signals and their complements at predetermined time intervals in response to the coincidence of received input signals. Separate signals are

generated at both the receipt of the input signals and at a first predetermined time afterwards. The signals are terminated at a second predetermined time of later occurrence than the first time.



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**3,600,688**

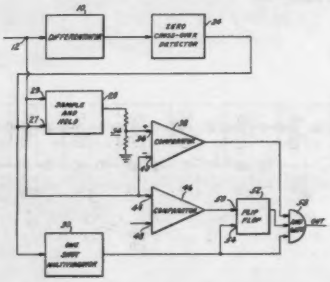
**SIGNAL DISCRIMINATOR CIRCUIT**

**Robert C. Booth, Bethlehem, Pa., assignor to Bethlehem Steel Corporation**

**Filed Apr. 21, 1970, Ser. No. 30,398**

**Int. Cl. H03k** *5/20*

**U.S. Cl. 328—111** **3 Claims**



A circuit, for eddy current testing of steel shapes, which discriminates input pulses caused by severe defects from input pulses caused by minor defects as well as pulses caused by changes in the properties of the shapes. The circuit discriminates input pulses greater than a minimum amplitude and less than a maximum width from other pulses.

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**3,600,689**

**AN ELECTRIC CONTROLLER WITH IMPROVED STABILIZER APPARATUS FOR THE STORAGE CAPACITOR**

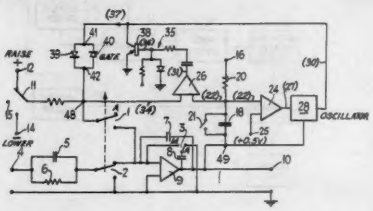
**Ian Carrodus Hutcheon, Bedfordshire; Stephen Arthur Foster, Harlington; Kenneth Barton, Dunstable, and Donald Louis Critten, Luton, all of, England, assignors to George Kent Limited, Luton, Bedfordshire, England**

**Filed Sept. 24, 1969, Ser. No. 860,689**

**Int. Cl. H03k** *5/00*

**U.S. Cl. 328—127** **19 Claims**

For stabilizing a voltage stored on a memory capacitor, an electric controller has a generator providing a recurrent ramp wave form. Each time the ramp wave form voltage rises to a reference level, an oscillator is switched on to provide a series of sawtooth pulses, beginning always at a peak. The ramp wave form and the stored voltage are fed to a differential amplifier so that this has an output when ramp wave form voltage exceeds the stored voltage. The amplifier output is used to open a gate to allow part of one of the sawtooth pulses to be fed to the capacitor as a correction pulse, unless the sawtooth pulse is at zero when the gate opens. The stored voltage is thus first brought, if necessary, to a value corresponding to a zero value of the sawtooth pulse and is



then stabilized at that value. The controller can operate either automatically or manually and the operation can be changed bumplessly and without balancing.

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**3,600,690**

**PHASE DIFFERENCE DETECTORS**

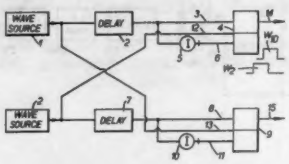
**Colin Graham White, Essex, England, assignor to The Marconi Company Limited, London, England**

**Filed May 25, 1970, Ser. No. 40,305**

**Claims priority, application Great Britain, June 23, 1969, 31505/69**

**Int. Cl. H03d** *13/00*

**U.S. Cl. 328—133** **2 Claims**



This invention provides a phase difference detector for detecting when the phase relationship between two waves changes from a predetermined relationship by a predetermined amount. Delay means are provided for relatively delaying the two waves to an extend dependent upon the lead or lag tolerance permitted in the phase relationship between the two waves, and a JK flip-flop circuit is provided to one data input terminal of which one of the two relatively delayed waves are applied and to the other data input terminal of which the same wave inverted is applied. The other of the delayed waves is applied to the sampling input terminal of said circuit.

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**3,600,691**

**SYNCHRONOUS DEMODULATOR**

**William P. Caywood, Jr., Murrysville, Pa., assignor to The United States of America as represented by the Secretary of the Army**

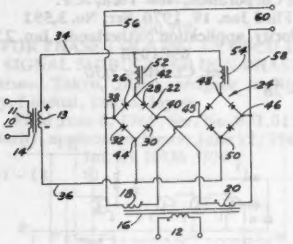
**Filed July 8, 1969, Ser. No. 839,828**

**Int. Cl. H03b** *3/04*

**U.S. Cl. 328—133** **8 Claims**

A synchronous demodulator which when supplied at its two sets of input terminals with two signals that are of dif-

ferent frequencies, develops at its output terminals, through a pair of oppositely poled demodulator bridges, a signal that includes the sum frequency and difference frequency of the two inputs.



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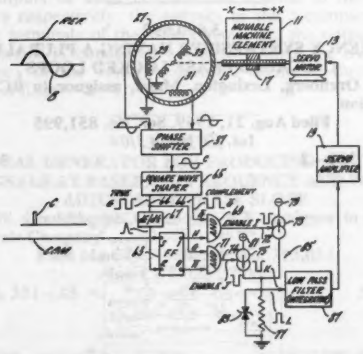
3,600,692

**PHASE COMPARATOR PROVIDING DC OUTPUT AS A FUNCTION OF VARIABLE PHASE BETWEEN TWO INPUTS**

**John K. McGee, Houston, Tex., assignor to Giddings & Lewis Machine Tool Company, Fond du Lac, Wis.**

Division of Ser. No. 555,048, June 3, 1966, Pat. No. 3,539,895.
Filed Oct. 17, 1969, Ser. No. 871,195
Int. Cl. H03b *3/04*
U.S. Cl. 328—134 4 Claims




A phase discriminator for producing a DC voltage which varies in magnitude and polarity according to the sense and extent of the phase displacement between two recurring signals which may vary in phase relation to one another. The first signal may, for example, be a train of pulses and the second signal may be a recurring sinusoidal wave. A tristate DC signal producing circuit is controlled by the two signals and its output is supplied to an averaging filter.

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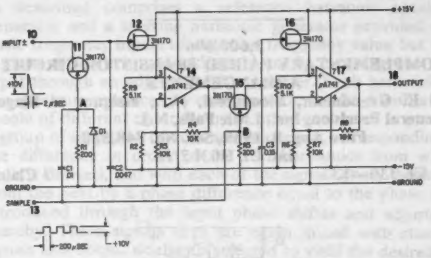
3,600,693

**SAMPLE-HOLD CIRCUIT**

**Bert P. VanDenBerg, China Lake, Calif., assignor to The United States of America as represented by the Secretary of the Navy**

Filed Aug. 3, 1970, Ser. No. 60,495
Int. Cl. H03k *19/00*
U.S. Cl. 328—151 4 Claims

A sample-hold circuit which provides an interface between the electronic and mechanical portions of a missile wherein it is required that a signal be held for a finite time comprising two complete sample-and-hold circuits in series.



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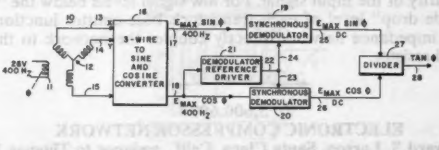
3,600,694

**POWER NORMALIZATION OF ANGULAR INFORMATION FROM THREE-WIRE SYNCHRO SOURCE**

**James H. McCollum, Jr., Cedar Rapids, Iowa, assignor to Collins Radio Company, Cedar Rapids, Iowa**

Filed Apr. 27, 1970, Ser. No. 31,895
Int. Cl. H03d *3/18*
U.S. Cl. 329—50 7 Claims




An angle defining synchro output signal is subject to variation stemming from synchro induced phase shift and transformation ratio variations between units, as well as by variations in carrier excitation source amplitude. By converting a three-wire synchro output to respective carrier signals modulated by sine and cosine functions of the synchro signal information angle, demodulating each synchronously with respect to a signal phased in accordance with one of the sine and cosine modulated signals, and subsequently dividing the demodulator outputs, an output signal proportional to the ratio of the sine and cosine functions of the angle is obtained which is not affected by changes in synchro phase shift, transformation ratio, and carrier energization magnitude.

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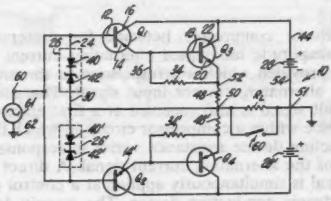
3,600,695

**POWER AMPLIFIER WITH OVERLOAD PROTECTION**

**Friedrich Johann Krausser, Jericho, N.Y., assignor to Emerson Electric Co.**

Filed Oct. 30, 1967, Ser. No. 679,119
Int. Cl. H03f *21/00, 3/10, 3/26*
U.S. Cl. 330—11 3 Claims



A transistor push-pull power amplifier, adapted to be connected to a loudspeaker, includes driver transistors and output power transistors. A shunt arm, preferably including a Zener diode and a reversely poled high-speed diode, is con-

nected between the base of each driver transistor and the loudspeaker. In the event of an overload, the shunt arms prevent excess current from harming the transistors of the amplifier.

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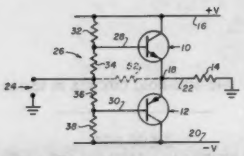
**3,600,696**
**COMPLEMENTARY PAIRED TRANSISTOR CIRCUIT ARRANGEMENTS**
**Paul E. Grandmont, Bloomfield, N.J., assignor to Singer-General Precision, Inc., Little Falls, N.J.**
**Filed Aug. 8, 1969, Ser. No. 848,520**
**Int. Cl. H03f 3/18**
**U.S. Cl. 330—13** **3 Claims**




An electrical circuit is provided comprising a pair of complementary transistors arranged as emitter followers, said transistors having their base-emitter circuits connected in parallel with each other and in series with a load resistor respectively. An impedance network is connected in parallel across the two base-emitter paths for biasing either one or the other transistor into conduction depending upon the polarity of the input signal. For low signal levels below the "-diode drop" level of each transistor's base-emitter junction, the impedance network directly couples the network to the load resistor.

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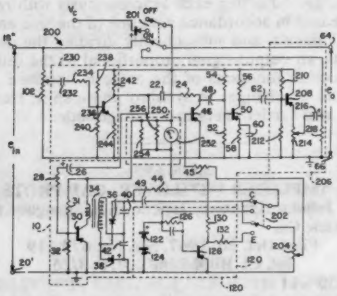
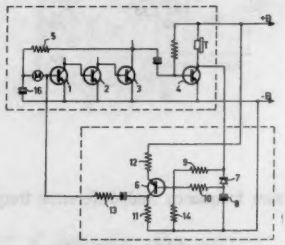
**3,600,697**
**ELECTRONIC COMPRESSOR NETWORK**
**Edward S. Larson, Santa Clara, Calif., assignor to Thomas J. Grogan, San Jose, Calif., a part interest**
**Filed Nov. 10, 1969, Ser. No. 875,225**
**Int. Cl. H03f 3/04**
**U.S. Cl. 330—24** **16 Claims**



An electronic compressor network for preserving the fidelity of amplitude modulated alternating current signals. Means are provided which are responsive to the amplitude level of an alternating current input signal. The alternating current input signal is also received at a first electron conducting device within a compressor circuit in which the electron conducting device resistance varies in response to the amplitude of the alternating current signal. A direct current control signal is simultaneously applied at a control element of the electronic conducting device. The magnitude of the impedance of the electron conducting device varies inversely relative to the magnitude of the input signal. The output of the first electron conducting device is fed to the input of a second electron conducting device having impedance operating characteristics complementary to those of the first electron conducting device.

**3,600,698**
**AMPLIFIER PROVIDED WITH AUTOMATIC LEVEL CONTROL**
**Willem Pieter Neidig, and Petrus Johannes Joseph Termeer, both of Emmasingel, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.**
**Filed Jan. 19, 1970, Ser. No. 3,592**
**Claims priority, application Netherlands, Jan. 23, 1969, 6901098**
**Int. Cl. H03g 3/30**
**U.S. Cl. 330—28** **4 Claims**



A transistor amplifier supplied with automatic level control by means of an auxiliary transistor circuit connected in a negative feedback circuit between the amplifier output and input electrodes. The emitter of the auxiliary transistor and the amplifier output electrode are both connected to the same terminal of the DC supply. The output electrode is also connected to the base of the auxiliary transistor via a first resistor connected in parallel with the same combination of a diode and a second resistor. A capacitor is connected between a point of constant potential and the junction of the second resistor and the diode so as to produce a DC control voltage for said base electrode.

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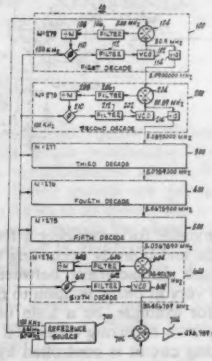
**3,600,699**
**FREQUENCY SYNTHESIZER HAVING A PLURALITY OF CASCADED PHASE LOCKED LOOPS**
**Arthur Orenberg, Lexington, Mass., assignor to RCA Corporation**
**Filed Aug. 21, 1969, Ser. No. 851,995**
**Int. Cl. H03b 3/04**
**U.S. Cl. 331—2** **9 Claims**



A frequency synthesizer is disclosed which can provide a signal having any frequency between DC and 1 megahertz in 1 hertz steps. The synthesizer has six decades each of which determines one digit in the six digit number representing the output frequency. Each decade is a phase locked loop and includes a voltage controlled oscillator, a mixer, a variable N network and a phase comparator the output of which determines the frequency of the oscillator. The N network in each decade is setable over a range of only 10 numbers N, the output of the N network being applied as one input to the phase

comparator. A signal is fed from the mixer to the N network having a frequency which is equal to the difference between the frequency of the oscillator in the loop including the mixer and one-tenth of the oscillator frequency of the preceding loop.

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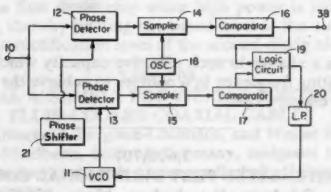
### 3,600,700
### CIRCUIT FOR PHASE LOCKING AN OSCILLATOR TO A SIGNAL MODULATED IN N-PHASES

**Yoshio Matsuo, Tokyo, Japan, assignor to Nippon Electric Company, Limited, Tokyo, Japan**

**Filed June 6, 1969, Ser. No. 831,012**
**Claims priority, application Japan, June 12, 1968, 43/40728**
**Int. Cl. H03b** *3/04*
**U.S. Cl. 331—12** **4 Claims**




A phase synchronizing circuit includes a voltage-controlled oscillator wherein the oscillatory frequency changes around a center $f_o$ by control against a digital input signal being modulated in $n$-phases of which the carrier frequency is $f_0$; $n$-phase detectors; $n$-comparators; a logic circuit having $n$-input terminals which performs an "exclusive or" or "negation of exclusive or" operation; and, a low-pass filter. The input signal, an output of the oscillator and the $n$-phase detectors are connected so as to detect phase components in the input signal wherein an output of the oscillator is the reference phase. The outputs of each detector are applied to the $n$-comparators respectively, the outputs of the $n$-comparators to $n$-input terminals of the logic circuit, and the output of the logic circuit is connected so as to control the oscillatory frequency of the voltage-controlled oscillator through the low-pass filter.

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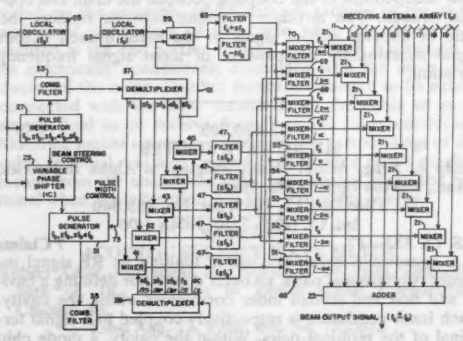
### 3,600,701
### SIGNAL GENERATOR FOR PRODUCING A SET OF SIGNALS AT BASEBAND FREQUENCY AND WITH ADJUSTABLE PHASE SLOPE

**Hugh W. Gouldthorpe, Cazenovia, N.Y., assignor to General Electric Company**

**Filed Mar. 14, 1968, Ser. No. 713,053**
**Int. Cl. H03b** *27/00*
**U.S. Cl. 331—45** **5 Claims**




This disclosure describes a signal generator for producing a family of signals of common frequency and of uniformly stepped phase progression with the rate of progression or phase slope adjustable. Signal sets of this character find application for control of beam direction in electronically steered array radiators of radar, sonar and communications systems, and in frequency selective filters of the kind tunable to scan through a band of frequencies. The signal generator as described comprises a reference harmonic spectrum generator and a steering harmonic generator provided with basic frequency inputs of common frequency value but with a phase difference made adjustable as by coupling one such input through an adjustable phase shifter. Each harmonic of the spectrum produced by one generator is mixed with a harmonic of different order from the other generator to provide a group of signals all of common frequency, corresponding to the difference in order of the two harmonics from which each is derived, and with each of the signals phase-displaced from the next by a phase difference equal to the phase shift introduced through the input phase shifter and adjustable thereby. These signals then are again mixed with steering signals and output sidebands selected to yield the desired set of output signals all of common frequency and of phase slope dependent upon the setting the adjustable phase shifter.

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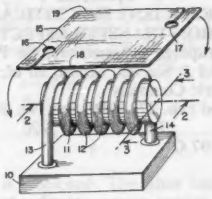
### 3,600,702
### DIFFUSE OPTICAL PUMPING SYSTEM FOR LASERS

**Leonard Charles De Bendedictis, Los Angeles, Calif., assignor to Union Carbide Corporation**

**Filed July 10, 1968, Ser. No. 743,793**
**Int. Cl. H01s** *3/09;* **F21v** *7/00;* **G02b** *5/08*
**U.S. Cl. 331—94.5** **7 Claims**



A diffuse reflector in the form of a flexible ceramic cloth material is provided in a process for light pumping a laser. The diffuse reflector encloses a laser medium and light source to increase the optical coupling between the light source and medium. The flexible nature of the cloth permits it to snugly engage about the light source and medium and conform to the geometries thereof in such a manner as to define a geometrical enclosure in which the medium constitutes substantially the only light sink for radiation from the light source.

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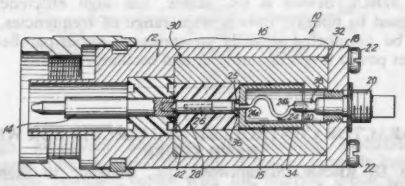
### 3,600,703
### SCHOTTKY BARRIER DIODE NOISE GENERATOR

**Robert G. Geissler, Cranford, N.J., assignor to Solitran Devices, Inc.**

**Filed July 2, 1969, Ser. No. 838,455**
**Int. Cl. H03b** *29/00*
**U.S. Cl. 331—78** **10 Claims**

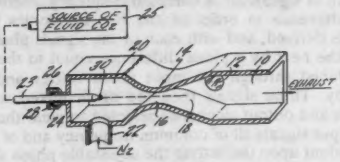


An electrical noise generator employs a Schottky barrier diode operative in the breakdown region as the active noise generating device in a noise generator circuit. The Schottky barrier diode employed is selected to have low internal resistance and uniformity of breakdown across the junction area.

## 3,600,704
## GAS LASER

Conrad M. Banas, Manchester; Allan P. Walch, Manchester, and Albert W. Angelbeck, East Hartford, all of, Conn., assignors to United Aircraft Corporation, East Hartford, Conn.

Filed Feb. 23, 1968, Ser. No. 710,697
Int. Cl. H01s 3/22
U.S. Cl. 331—94.5 10 Claims

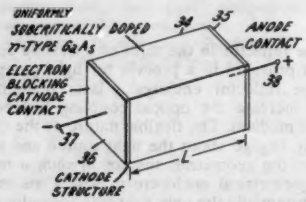



$CO_2$ particles, including small particles for laser chamber cooling and large particles for remote mixing purposes, are injected into the stream of an excited energizing gas in a gas laser, the solid $CO_2$ subliming to a gas, becoming excited through resonant collision energy transfer with the energizing gas, and emitting photons so as to generate the laser output.

## 3,600,705
## HIGHLY EFFICIENT SUBCRITICALLY DOPED ELECTRON-TRANSFER EFFECT DEVICES

Wirojana Tantraporn, Schenectady; Se Puan Yu, Schenectady, and Paul J. Shaver, Scotia, all of, N.Y., assignors to General Electric Company

Filed Feb. 27, 1969, Ser. No. 802,796
Int. Cl. H03b 7/06
U.S. Cl. 331—107 G 22 Claims



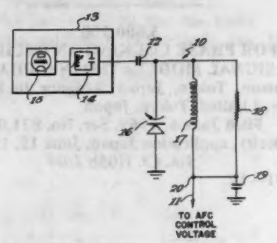

The subcritically-doped injection-current-limited (SDICL) microwave amplifier device comprises a bulk semiconductor having a doping density-length ($n_oL$) product below the critical value needed to sustain Gunn oscillation, in which the electric field is maintained approximately uniform above the threshold field in the vicinity of the cathode and elsewhere by limiting the injection of charge carriers. The injection current is limited by the conduction characteristics of the cathode structure or by tapering the bulk semiconductor. The SDICL device is DC stable, has high efficiency, is designed to operate over a wide range of frequencies, and can be connected directly in series or series-parallel for higher power levels in amplifier and oscillator circuits.

## 3,600,706
## VARACTOR CONTROLLED AFC CIRCUIT FOR WIDE BAND TUNER

Dean D. Ritchie, Streamwood, Ill., assignor to Standard Kollsman Industries, Inc., Melrose Park, Ill.

Filed Aug. 29, 1969, Ser. No. 854,101
Int. Cl. H03j 3/18
U.S. Cl. 331—177 V 3 Claims

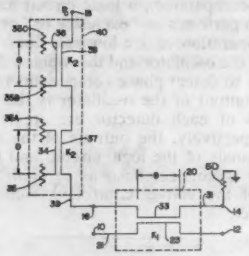
An AFC control circuit for an oscillator that is tunable over a wide frequency band produces a relatively constant frequency change or "pull-in" range at any frequency value within the band. The control circuit is connected across the main capacitance of the oscillator's resonant circuit and is comprised of a varactor and a parallel inductance that define a reference resonant frequency lower than any frequency value within the band. The control circuit exhibits an effective capacity at all frequencies of interest and the varactor provides a change in such effective capacity which is related to operating frequency in a manner to achieve the uniform "pull-in" characteristic.




## 3,600,707
## COMPENSATED FLAT DIRECTIONAL COUPLER

David S. Friedman, Framingham, Mass., assignor to Alpha Industries, Inc., Newton Upper Falls, Mass.

Filed June 9, 1969, Ser. No. 831,590
Int. Cl. H01p 5/14
U.S. Cl. 333—10 9 Claims



A compensated flat directional coupler includes a main branch carrying an electrical signal and a coupled branch carrying a coupled electrical signal responsive to the signal on the main branch. The coupled branch includes an auxiliary compensating network in the output portion of the coupled branch. The auxiliary compensating network couples to the coupled branch and is substantially isolated from the main branch. The auxiliary compensating network is substantially independent of the coupling between the main and coupled branch. The auxiliary coupling network renders the ratio of coupled output signal to the main branch output signal substantially independent of input signal frequency variation.

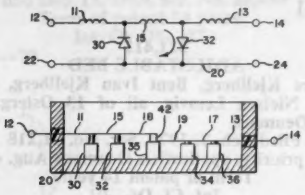
## 3,600,708
## MICROWAVE LIMITER

Philip E. King, Acton, Mass., assignor to Alpha Industries, Inc., Newton Upper Falls, Mass.

Filed Dec. 17, 1969, Ser. No. 885,840
Int. Cl. H03h 7/10; H04b 3/06
U.S. Cl. 333—17 7 Claims

A microwave device for use in limiting an RF signal includes two terminal pairs, an outer conductor defining a cavity and first and second inner conductors within the cavity. Each inner conductor is respectively coupled to a signal terminal of the terminal pairs. Within the cavity, a diode chip has one of its terminals connected to the first inner conductor and its other terminal connected to the outer conductor. A second diode chip, oppositely poled, has one of its terminals connected to the second inner conductor and its other terminal connected to the outer conductor. A third inner

conductor within the cavity intercouples the terminals of the diode chips coupled to the inner conductors. Preferably, the first diode chip is a high-power type and the second diode

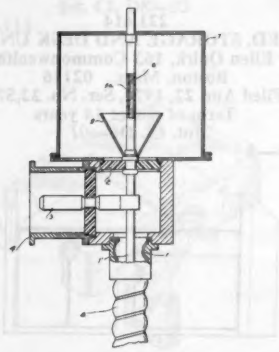


chip rectifies at a lower power level and pumps signal through the first diode chip when high power is incident to the device, thereby limiting the signal level at the output terminal to the rectification level of the second diode chip.

### 3,600,709
### TERMINAL ASSEMBLY FOR THE END PORTION OF A FLUID-COOLED COAXIAL CABLE

**Hans Leo Ditscheid, Bergisch-Gladbach, and Walter Scherrer, Cologne-Muelheim, both of, Germany, assignors to Felten & Guilleaume Carlswerk Aktiengesellschaft, Cologne-Muelheim, Germany**

**Filed Sept. 23, 1968, Ser. No. 761,678**
**Claims priority, application Germany, Oct. 6, 1967, P 16 40 104.0**
**Int. Cl. H01b *7/34;* H01p *1/26;* H03p *13/00***
**U.S. Cl. 333—33** **8 Claims**



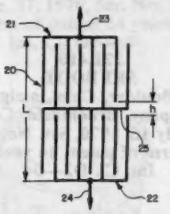
A cable terminal assembly to be secured to an end portion of a high frequency cable of the type having an outer and a coaxial tubular fluidtight inner conductor through which a cooling fluid is to be circulated. Conductor means is provided on the assembly which extends radially of the outer and inner conductors of the cable when the assembly is secured to the end portion thereof, and which is arranged to be electrically conductively connected with the inner conductor of the cable. Conduit means is arranged to be axially connected with the inner conductor of the cable so as to supply fluid to or receive fluid from the inner conductor. Shielding means serves to shield both the surroundings of the cable terminal and also cooling fluid flowing in the conduit means from the electromagnetic field created about the terminal when the cable transmits high frequency energy.

### 3,600,710
### ACOUSTIC SURFACE WAVE FILTER

**Robert Adler, Northfield, and Adrian J. De Vries, Elmhurst, both of, Ill., assignors to Zenith Radio Corporation, Chicago, Ill.**

**Filed Aug. 12, 1968, Ser. No. 752,073**
**Int. Cl. H03h *9/30, 9/32***
**U.S. Cl. 333—72** **6 Claims**

A body of piezoelectric material propagates acoustic surface waves. A first surface wave interaction device is actively coupled to that surface to interact with the waves. Spaced on the same surface from the first device is a second such interaction device. The interaction devices are segmented into a plurality of interjacent arrays of electrode elements and the spacing between successive electrode elements is equal to an integral multiple of one-half wavelength at the desired

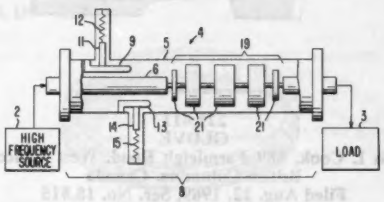


operating frequency. The arrays are electrically coupled in series and are disposed to effect cumulative interaction with the surface waves.

### 3,600,711
### COAXIAL FILTER HAVING HARMONIC REFLECTIVE AND ABSORPTIVE MEANS

**Richard Z. Gerlack, Cupertino, Calif., assignor to Varian Associates, Palo Alto, Calif.**

**Filed Aug. 13, 1969, Ser. No. 849,715**
**Int. Cl. H03h *13/00;* H01p *1/22***
**U.S. Cl. 333—73 C** **6 Claims**

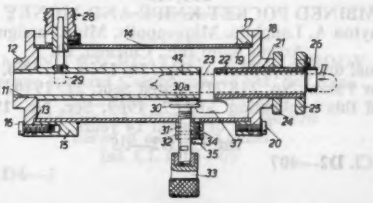



A coaxial filter is disclosed. The filter includes a coaxial line having resonant reflector means carried from the outer conductor for reflecting harmonic wave energy toward the source while permitting fundamental wave energy to pass through the coaxial line to a load. A harmonic resonant means is disposed between the harmonic reflectors and the source for picking up and absorbing the harmonic energy in a load disposed externally of the outer conductor.

### 3,600,712
### APPARATUS FOR THE EXCITATION OF ELECTRODELESS DISCHARGE TUBES

**Vivian R. Williamson, Braintree, England, assignor to Evans Electroselenium Limited, Braintree, England**

**Filed Dec. 16, 1969, Ser. No. 885,602**
**Claims priority, application Great Britain, Dec. 23, 1968, 61155/68**
**Int. Cl. H01p *7/06;* H01j *11/00, 19/80***
**U.S. Cl. 333—83 R** **11 Claims**



High efficiency apparatus for exciting electrodeless discharge tubes in which the tube is placed partially inside a cylindrical resonant cavity with the internal metal coated area of the discharge tube in a gap between the cavity and a sleeve having its axis in longitudinal alignment with the axis of the cavity, and a capacitor plate outside the cavity is movable towards and away from the cavity axis in order to tune the cavity to the exact frequency of the energizing supply.

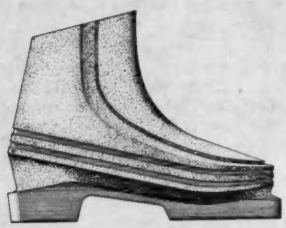
### ERRATUM

For Class 335—216 see:
Patent No. 3,600,281

# DESIGNS

AUGUST 17, 1971

**221,410**
**SKI BOOT**
Chris A. Hanson, Boulder, Colo., assignor to The Lange Company, Broomfield, Colo.
Filed July 15, 1970, Ser. No. 23,968
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—276

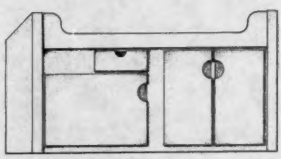


**221,411**
**GLOVE**
Deloris I. Cook, 889 Farmleigh Road, West Vancouver, British Columbia, Canada
Filed Aug. 22, 1969, Ser. No. 18,815
Term of patent 14 years
Int. Cl. D2—*07*
U.S. Cl. D2—364

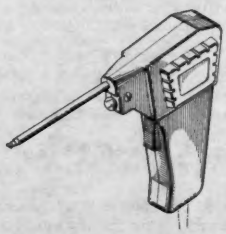
**221,412**
**COMBINED POCKET KNIFE AND MONEY CLIP**
Clayton A. Laughlin, Minneapolis, Minn., assignor to Arthur Salm Inc., Chicago, Ill.
Original design application Sept. 20, 1968, Ser. No. 13,640, now Patent No. 218,729, dated Sept. 22, 1970. Divided and this application Aug. 7, 1969, Ser. No. 19,342
Term of patent 14 years
Int. Cl. D2—*08*
U.S. Cl. D2—407

**221,413**
**ADJUSTABLE BED**
Finn Andre Kjellberg, Bent Ivan Kjellberg, and Sven Edward Nielsen Lemvig, all of 13 Ostergade, 3700 Ronne, Denmark
Filed Feb. 2, 1970, Ser. No. 21,218
Claims priority, application Denmark Aug. 4, 1969
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D5—4

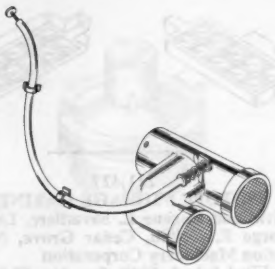
**221,414**
**BED, STORAGE AND DESK UNIT**
Mary Ellen Quirk, 163 Commonwealth Ave., Boston, Mass. 02116
Filed Apr. 22, 1970, Ser. No. 22,574
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D5—4



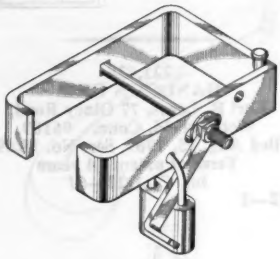
**221,415**
**SOLDERING PISTOL**
Rinze P. Elzinga, Nijkerk, Netherlands, assignor to Technische Industrie Elko N.V., Nijkerk, Netherlands
Filed Nov. 20, 1969, Ser. No. 20,193
Term of patent 7 years
Int. Cl. D8—*02*
U.S. Cl. D8—30



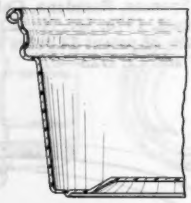
221,416
CHAIN SAW WARNING DEVICE OR SIMILAR ARTICLE
Donald Jennings, P.O. Box 237, Cascade, Idaho 83611
Filed Dec. 11, 1969, Ser. No. 20,458
Term of patent 14 years
Int. Cl. D8—*02*
U.S. Cl. D8—70



221,417
VEHICLE WHEEL LOCK
Wilson Prichard, 670 E. 49th St., Hialeah, Fla. 33013
Filed Apr. 30, 1970, Ser. No. 22,729
Term of patent 14 years
Int. Cl. D8—*03*
U.S. Cl. D8—113

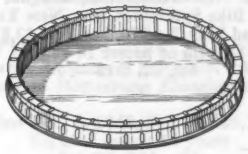


221,418
PACKAGING CUP
Alfred W. Kinney, Kansas City, Mo., assignor to Phillips Petroleum Company
Filed Feb. 5, 1970, Ser. No. 21,291
Term of patent 14 years
Int. Cl. D9—*99*
U.S. Cl. D9—220



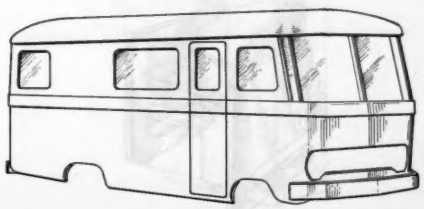
221,419
CONTAINER FOR A FOOD SPREAD
Miles R. Grove, New York, N.Y., assignor to Lever Brothers Company, New York, N.Y.
Filed Apr. 27, 1970, Ser. No. 22,943
Term of patent 14 years
Int. Cl. D9—*99*
U.S. Cl. D9—220

221,420
CONTAINER LID
Paul Davis, Swampscott, Mass., assignor to Sweetheart Plastics, Inc., Wilmington, Mass.
Filed Mar. 11, 1970, Ser. No. 21,855
Term of patent 14 years
Int. Cl. D9—*02*
U.S. Cl. D9—267



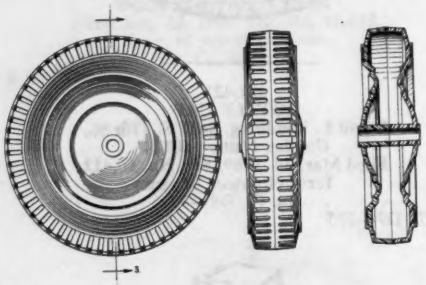
221,421
BOTTLE CAP
David L. Lundberg, 3417 S. 77th St., Omaha, Nebr. 68124
Filed Mar. 24, 1969, Ser. No. 16,412
Term of patent 14 years
Int. Cl. D9—*02*
U.S. Cl. D9—275

221,422
CAMPING RECREATION VEHICLE BODY
George Richard Geldbaugh, 46 SW. 9th Ave., Boca Raton, Fla. 33432
Filed Oct. 22, 1969, Ser. No. 19,670
Term of patent 14 years
Int. Cl. D12—*09*
U.S. Cl. D4—3

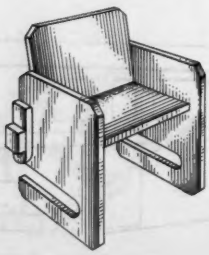


221,423
CART BODY
Harold Douglas Seielstad, Jr., Birmingham, Mich., assignor to Midwest Aero Industries Corporation, Royal Oak, Mich.
Filed July 28, 1970, Ser. No. 24,192
Term of patent 14 years
Int. Cl. D12—*02*
U.S. Cl. D14—3

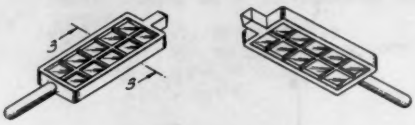
221,424
JUVENILE VEHICLE WHEEL
Harry Golden, New York, N.Y., assignor to Ideas for Auto and Bike Specialties, Inc., New York, N.Y.
Filed May 7, 1970, Ser. No. 22,878
Term of patent 14 years
Int. Cl. D12—*14*
U.S. Cl. D14—30



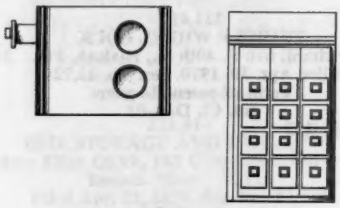
221,425
CHILD'S SEAT
Joseph S. Pasakarnis, Jr., 4401 Elm St., Downers Grove, Ill. 60515
Filed Apr. 22, 1970, Ser. No. 22,555
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D15—1



221,426
DIP INOCULUM SLIDE
Arnold Brecker, London, England, assignor to Oxoid Limited, London, England
Filed July 11, 1969, Ser. No. 18,179
Claims priority, application Great Britain May 13, 1969
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D16—1



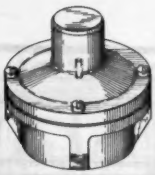
221,427
ISOTOPE STORAGE CABINET
Felix R. Grat and Eugene L. Savettiere, Lake Hiawatha, and George E. Griffin, Cedar Grove, N.J., assignors to Radiation Machinery Corporation
Filed July 1, 1969, Ser. No. 18,010
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D16—2



221,428
HANDGUN GRIP
Karl R. Lewis, 77 Olney Road, Wethersfield, Conn. 06109
Filed Aug. 15, 1969, Ser. No. 18,695
Term of patent 14 years
Int. Cl. D22—*01*
U.S. Cl. D22—1

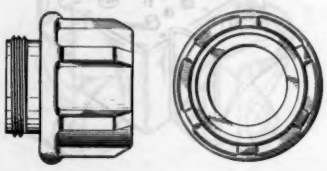
221,429
SWING SPOUT
Tor Petterson, San Pedro, Calif., assignor to Lloyd Spencer, Pasadena, Calif.
Filed May 8, 1970, Ser. No. 22,896
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—32

221,430
VALVE
Bernie E. Robinson, Oak Creek, Wis., assignor to Milwaukee Valve Company, Inc., Milwaukee, Wis.
Filed Jan. 5, 1970, Ser. No. 20,764
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—19



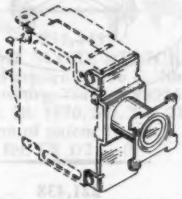
221,431
MIXING VALVE HANDLE
Tor Petterson, San Pedro, Calif., assignor to Lloyd Spencer, Pasadena, Calif.
Filed May 8, 1970, Ser. No. 22,895
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—29

221,432
HOSE COUPLING
Jerald V. Dunlap, P.O. Box 1541, Santa Monica, Calif. 90406
Filed Jan. 23, 1969, Ser. No. 15,472
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—43

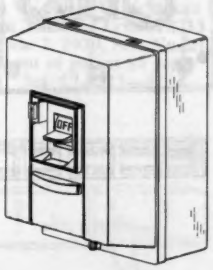


221,433
SAUNA HEATER
Albert F. Erickson, Arlington Heights, and Linas Burys, Chicago, Ill., assignors to Air Xperts Corporation, Chicago, Ill., and Sauna Corporation of America, Chippewa Falls, Wis., fractional part interest to each
Continuation of design applications Ser. No. 15,467 and Ser. No. 15,468, both Jan. 23, 1969, both now abandoned. This application June 11, 1969, Ser. No. 17,768
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—84

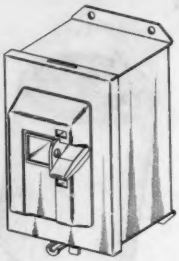
221,434
ADAPTER FOR A CIRCUIT BREAKER
Ralph B. Davis, Lawrence Township, Mercer County, N.J., assignor to Heinemann Electric Company, Trenton, N.J.
Filed Dec. 2, 1969, Ser. No. 20,330
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D26—13



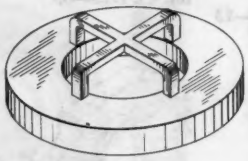
221,435
ELECTRICAL SWITCH ENCLOSURE
Joseph J. Gribble and Don J. Arneberg, Milwaukee, Wis., and David E. Scott, Royal Oak, Mich., assignors to Square D Company, Park Ridge, Ill.
Filed Feb. 6, 1970, Ser. No. 21,317
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D26—13



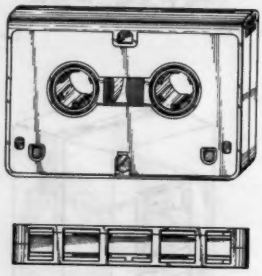
**221,436**
**ELECTRICAL SWITCH ENCLOSURE**
**Lewis M. Lehman and John R. Stauder, Milwaukee, Wis., and David E. Scott, Royal Oak, Mich., assignors to Square D Company, Park Ridge, Ill.**
**Filed Feb. 6, 1970, Ser. No. 21,318**
**Term of patent 14 years**
**Int. Cl. D13—*03***
**U.S. Cl. D26—13**



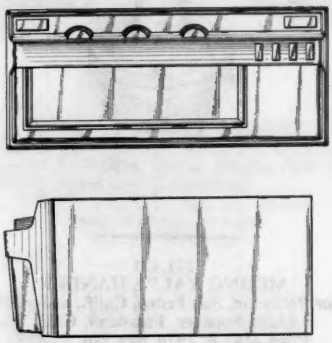
**221,437**
**TAPE REEL WEIGHT**
**Harry S. Dearling, 25 E. 83rd St., New York, N.Y. 10028**
**Filed June 25, 1969, Ser. No. 17,880**
**Term of patent 14 years**
**Int. Cl. D14—*99***
**U.S. Cl. D26—14**



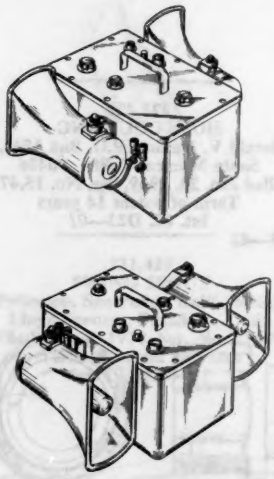
**221,438**
**RECORDING AND REPRODUCING CARTRIDGE**
**Shoichi Saito, Tokyo, Japan, assignor to Olympus Optical Company Limited, Tokyo, Japan**
**Filed Oct. 2, 1969, Ser. No. 19,386**
**Claims priority, application Japan May 19, 1969**
**Term of patent 14 years**
**Int. Cl. D14—*01***
**U.S. Cl. D26—14**



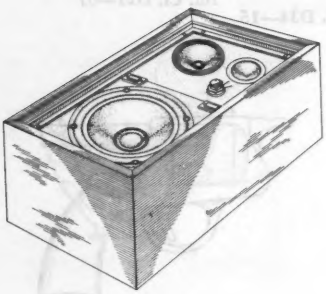
**221,439**
**AUTOMOBILE TAPE PLAYER OR SIMILAR ARTICLE**
**Robert E. Mowris, Janesville, Wis., assignor to Gibbs Special Products Corporation, Janesville, Wis.**
**Filed Feb. 16, 1970, Ser. No. 21,455**
**Term of patent 14 years**
**Int. Cl. D14—*01, 03***
**U.S. Cl. D26—14**



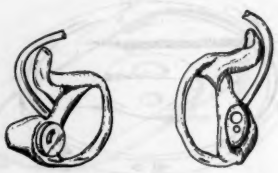
**221,440**
**PORTABLE PUBLIC ADDRESS SYSTEM**
**David G. Biddulph and Stephen L. Hermann, Phoenix, Ariz., assignors to Environmental Tactics Corporation**
**Filed Feb. 19, 1970, Ser. No. 21,253**
**Term of patent 14 years**
**Int. Cl. D14—*03, 04***
**U.S. Cl. D26—14**



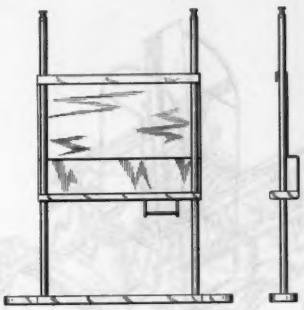
221,441
SPEAKER CABINET
Haruo Ishikawa, 3–314, 1246 Matsunoki Jutaku, Matsunoki-chi Suginami-ku, Tokyo, Japan
Filed Mar. 4, 1970, Ser. No. 21,729
Claims priority, application Japan Dec. 26, 1969
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D26—14



221,442
EAR INSERT FOR A HEARING AID
Abraham Feingold, 32—33 147th Place, Flushing, N.Y. 11354
Filed Aug. 5, 1970, Ser. No. 24,309
Term of patent 14 years
Int. Cl. D14—*04;* D24—*99*
U.S. Cl. D26—14

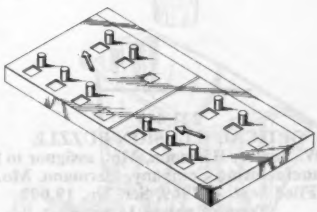


221,443
PORTABLE TRAY ASSEMBLY FOR SOLDERING APPARATUS
Paul V. De Luca, Port Washington, N.Y., assignor to Porta Systems Corporation, Port Washington, N.Y.
Filed June 9, 1970, Ser. No. 23,390
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D33—3

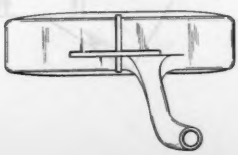


221,444
TABLE
Victor Lukens, 300 E. 51st St., New York, N.Y. 10022
Filed May 27, 1969, Ser. No. 17,382
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D33—14

221,445
GAME SCORE DEVICE
Alan R. Bergstrom, 906 E. 4th St., Ellensburg, Wash. 98926
Filed Jan. 28, 1970, Ser. No. 21,126
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5



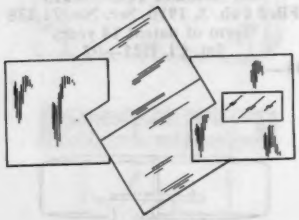
221,446
GOLF PUTTER HEAD
Raymon W. Cook, 1026 Mount Eden, San Antonio, Tex. 78213
Filed Feb. 3, 1970, Ser. No. 21,228
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5



221,447
TILTABLE EXERCISE BOARD OR THE LIKE
John M. Brubaker, Star Rte., Box 48, Hammett, Idaho 83627
Filed Mar. 30, 1970, Ser. No. 22,085
Term of patent 14 years
Int. Cl. D21—*03*
U.S. Cl. D34—5

221,448
SPOON WITH A MUSICAL DEVICE
Taizo Ishida, 14 of 2, Tokiwa 4, Urawa-shi, Saitamaken, Japan
Filed May 22, 1969, Ser. No. 17,287
Claims priority, application Japan Feb. 20, 1969
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—15

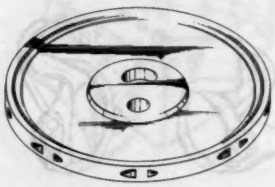
221,449
OPTICAL ILLUSION PUZZLE
Beverly W. Taylor, Hermann, Mo., assignor to Steven Manufacturing Company, Hermann, Mo.
Filed Sept. 4, 1969, Ser. No. 19,002
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—15



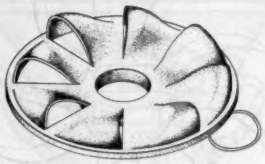
221,450
CURVED TRACK SECTION FOR MINIATURE TOY VEHICLES
William R. Baynes and Harvey W. La Branche, Palos Verdes Peninsula, and George Soulakis, Los Angeles, Calif., assignors to Mattel, Inc., Hawthorne, Calif.
Filed Feb. 2, 1970, Ser. No. 21,178
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—15

221,451
NOVELTY PISTOL
Marvin C. Hewett, 5273 Independence Road, Boulder, Colo. 80302
Filed Mar. 10, 1970, Ser. No. 21,838
Term of patent 7 years
Int. Cl. D21—*01*
U.S. Cl. D34—15

221,452
SPINNING TOY OR SIMILAR ARTICLE
Elmer W. Swanberg, 1420 E. 58th Ave., Spokane, Wash. 99203
Filed Mar. 30, 1970, Ser. No. 22,086
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—15

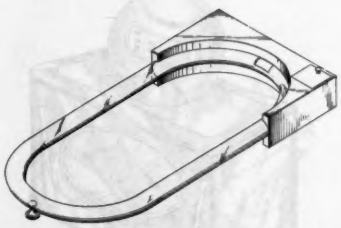


221,453
FLYING TOP TOY
Elmer W. Swanberg, 1420 E. 58th Ave., Spokane, Wash. 99203
Filed Mar. 30, 1970, Ser. No. 22,109
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—15



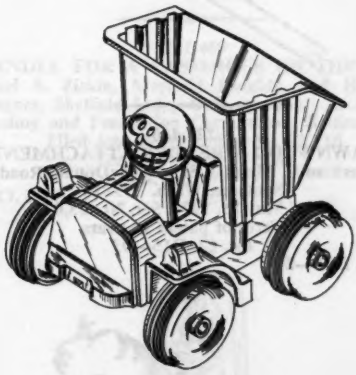
221,454
ANIMAL FIGURE SEAT FOR PLAYGROUND APPARATUS
Steven A. Henning and Philip G. Miller, Anderson, Ind., assignors to American Playground Device Co., Anderson, Ind.
Filed Apr. 23, 1970, Ser. No. 22,609
Term of patent 14 years
Int. Cl. D21—*04*
U.S. Cl. D34—15

221,455
PNEUMATIC SKILL TOY
Elmer W. Swanberg, 1420 E. 58th Ave. 99203, and Frank R. Drury, E. 12023 19th 99206, both of Spokane, Wash.
Filed May 15, 1970, Ser. No. 23,020
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15

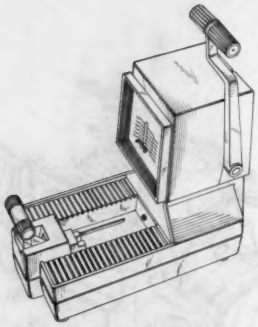


221,456
TOY WHEELED VEHICLE OR THE LIKE
Richard E. Henderson, Huntington Beach, Calif., assignor to Mattel, Inc., Hawthorne, Calif.
Filed June 8, 1970, Ser. No. 23,345
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15

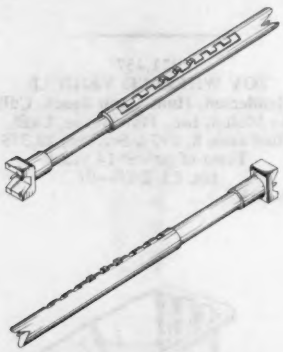
221,457
TOY WHEELED VEHICLE
Richard E. Henderson, Huntington Beach, Calif., assignor to Mattel, Inc., Hawthorne, Calif.
Filed June 8, 1970, Ser. No. 23,359
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15



221,458
TOY PUMP FOR FILLING TOY VEHICLES, AND THE LIKE, WITH COMPRESSED AIR
Martin L. Blumenthal, Chatham Township, N.J., assignor to Topper Corporation
Filed June 24, 1970, Ser. No. 23,940
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15

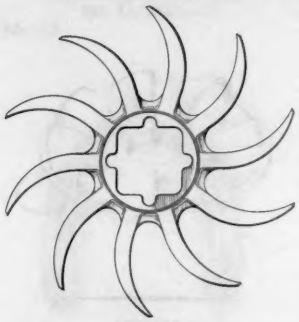


221,459
ADJUSTABLE BRANCH SPREADER
Ralph Wolf, 1115 Reservoir Road, and Douglas R. Evans Rte. 8, Box 439, both of Yakima, Wash. 98902
Filed June 29, 1970, Ser. No. 23,716
Term of patent 14 years
Int. Cl. D8—*01, 03*
U.S. Cl. D35—1

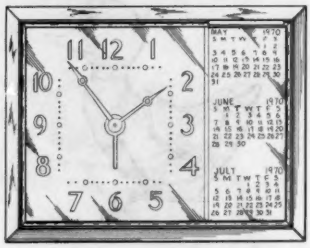


221,460
LAWN FOOD SPREADER ATTACHMENT
Herman R. Matthes, 824 N. McDonald Road, Spokane, Wash. 99216
Filed May 15, 1970, Ser. No. 23,021
Term of patent 14 years
Int. Cl. D15—*03*
U.S. Cl. D35—2

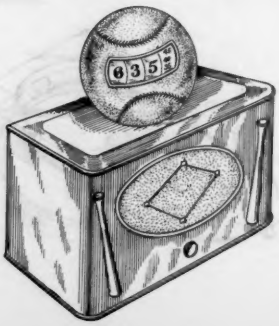
221,461
ROTARY CULTIVATOR SPIDER
Roy W. Hagenstad, Crosslake, Minn. 56442
Filed Jan. 2, 1970, Ser. No. 20,746
Term of patent 14 years
Int. Cl. D15—*03*
U.S. Cl. D39—1



221,462
COMBINED CLOCK AND CALENDAR
Erich Rittinghaus, Kreis, Neu-Ulm, Bavaria, Germany, assignor to Uhrenfabrik Senden GmbH, Ulm (Danube), Germany
Filed Nov. 3, 1969, Ser. No. 19,878
Term of patent 3½ years
Int. Cl. D10—*01*
U.S. Cl. D42—7

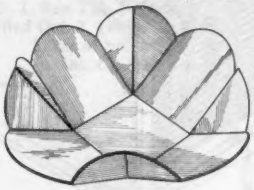


221,463
CLOCK
Max S. Polisky, 1261 N. Laurel Ave., Los Angeles, Calif. 90046
Filed Nov. 4, 1969, Ser. No. 19,925
Term of patent 14 years
Int. Cl. D10—*01*
U.S. Cl. D42—7

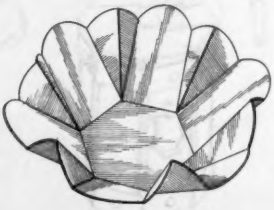


221,464
CLOCK
Max S. Polisky, 1261 N. Laurel Ave., Los Angeles, Calif. 90046
Filed Nov. 12, 1969, Ser. No. 20,034
Term of patent 14 years
Int. Cl. D10—*01*
U.S. Cl. D42—7

221,465
DISH FOR NUTS OR THE LIKE
George Sera, Mount Prospect, Ill., assignor to Kenyon & Eckhardt, Inc., New York, N.Y.
Filed Apr. 14, 1970, Ser. No. 22,427
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D44—10



221,466
DISH FOR NUTS OR THE LIKE
George Sera, Mount Prospect, Ill., assignor to Kenyon & Eckhardt, Inc., New York, N.Y.
Filed Apr. 14, 1970, Ser. No. 22,428
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D44—10



221,467
HANDLE FOR A TRAY OR THE LIKE
Manuel E. Ziskin, Mayfield Heights, and Harold O. Wagner, Sheffield Lake, Ohio, assignors to American Trading and Production Corporation, Baltimore, Md.
Filed Apr. 29, 1970, Ser. No. 22,714
Term of patent 14 years
Int. Cl. D7—*99*
U.S. Cl. D44—29

221,468
HANDLE FOR A HOSTESS TRAY OR THE LIKE
Manuel S. Ziskin, Mayfield Heights, and Harold O. Wagner, Sheffield Lake, Ohio, assignors to American Trading and Production Corporation, Baltimore, Md.
Filed Apr. 29, 1970, Ser. No. 22,715
Term of patent 14 years
Int. Cl. D7—*99*
U.S. Cl. D44—29

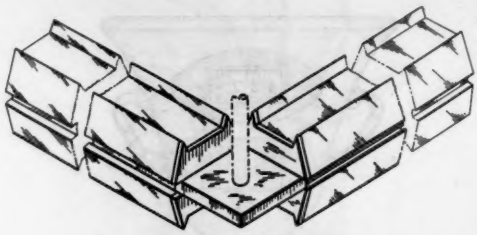
221,469
HANDLE FOR A CASSEROLE OR THE LIKE
Manuel S. Ziskin, Mayfield Heights, and Harold O. Wagner, Sheffield Lake, Ohio, assignors to American Trading and Production Corporation, Baltimore, Md.
Filed Apr. 29, 1970, Ser. No. 22,716
Term of patent 14 years
Int. Cl. D7—*99*
U.S. Cl. D44—29

**221,470**
**ICE CREAM DISPENSER**
Sidney Sevell, 320 Wyoming Ave., North Massapequa, N.Y. 11758
Filed Apr. 8, 1970, Ser. No. 22,328
Term of patent 3½ years
Int. Cl. D7—*99*
U.S. Cl. D44—29

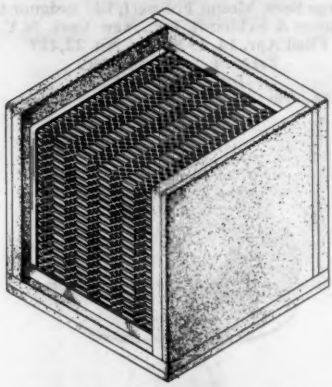
**221,471**
**CUFF LINK**
Herman Winkler, 62 Alden Court, Malverne, N.Y. 11565
Filed Apr. 14, 1970, Ser. No. 22,426
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D45—1

**221,472**
**CHARM FOR BRACELET OR THE LIKE**
Bertha S. Wolfe, 6154 W. 76th St., Los Angeles, Calif. 90045
Filed July 27, 1970, Ser. No. 23,147
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D45—17

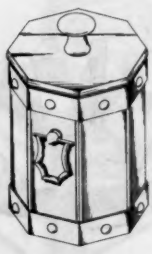
**221,473**
**FLUORESCENT LIGHTING FIXTURE**
Mitchell Bobrick, Pacific Palisades, Calif., assignor to Linear Lighting Co., Palisades, N.Y.
Original design application Mar. 4, 1968, Ser. No. 10,846, now Patent No. 218,356, dated Aug. 11, 1970. Divided and this application Dec. 19, 1968, Ser. No. 18,360
Term of patent 14 years
Int. Cl. D26—*02*
U.S. Cl. D48—23



**221,474**
**OUTDOOR LIGHTING FIXTURE HOUSING**
Fred M. Gore, Carrollton, Tex., assignor to Lans-Cube, Inc., Dallas, Tex.
Filed May 1, 1970, Ser. No. 22,754
Term of patent 14 years
Int. Cl. D26—*03*
U.S. Cl. D48—31

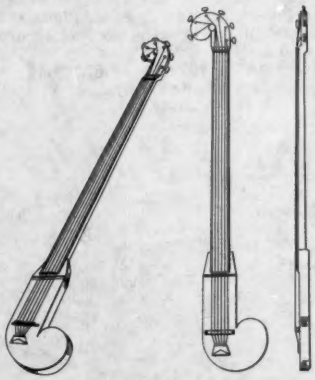


**221,475**
**WASTE RECEPTACLE OR THE LIKE**
Peter E. Norquest, 2001 Hervey, Boise, Idaho 83705
Filed Feb. 25, 1970, Ser. No. 21,613
Term of patent 14 years
Int. Cl. D7—*99*
U.S. Cl. D49—35

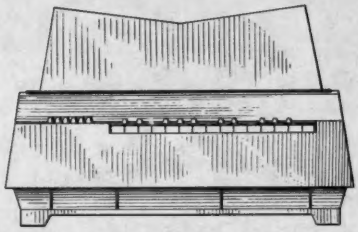


221,476
PRESSURE GAUGE
Clyde J. Martin, Cincinnati, Ohio, assignor to Martin Industries, Inc., Cincinnati, Ohio
Filed Mar. 18, 1970, Ser. No. 21,958
Term of patent 14 years
Int. Cl. D10—*08*
U.S. Cl. D52—6

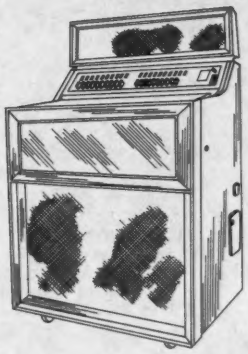
221,477
ELECTRIC STRINGED INSTRUMENT
Robert C. Turner, New York, N.Y.
(R.F.D. 1, Box 190, Burton, Wash. 98013)
Filed Oct. 2, 1969, Ser. No. 19,388
Term of patent 14 years
Int. Cl. D17—*03*
U.S. Cl. D56—1



221,478
CHORD ORGAN
William Macowski, Jr., Montclair, N.J., assignor to Magnus Organ Corporation, Linden, N.J.
Filed Mar. 13, 1970, Ser. No. 21,892
Term of patent 14 years
Int. Cl. D17—*01*
U.S. Cl. D56—2

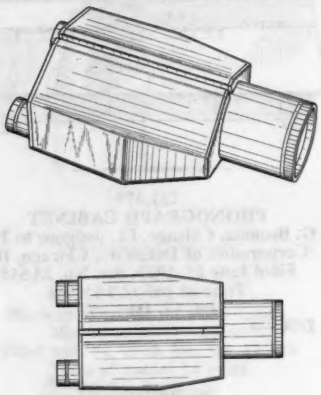


221,479
PHONOGRAPH CABINET
William G. Broman, Chicago, Ill., assignor to The Seeburg Corporation of Delaware, Chicago, Ill.
Filed June 25, 1970, Ser. No. 23,658
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D56—4

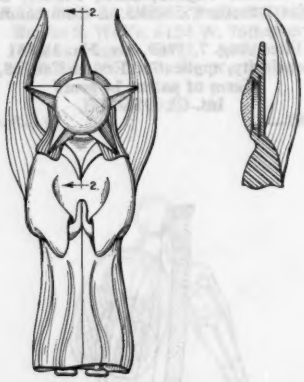


221,480
OPHTHALMIC SPECTACLES
Luc Andre Marcel Tagnon, Paris, France, assignor to Société des Lunetiers, Société en Commandite Simple, Paris, France
Filed Aug. 7, 1969, Ser. No. 18,581
Claims priority, application France Feb. 28, 1969
Term of patent 14 years
Int. Cl. D16—*08*
U.S. Cl. D57—1

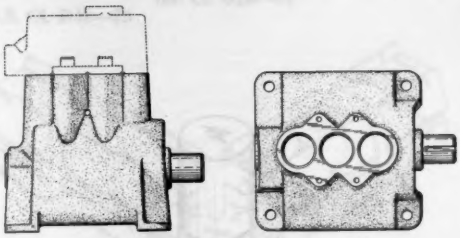
**221,481**
**BINOCULAR TELESCOPE OR THE LIKE**
Franz Hoffmann, Vienna, Austria, assignor to Karl Vockenhuber & Raimund Hauser, Vienna, Austria
Filed Dec. 22, 1969, Ser. No. 20,605
Claims priority, application Austria June 23, 1969
Term of patent 14 years
Int. Cl. D16—*08*
U.S. Cl. D57—1



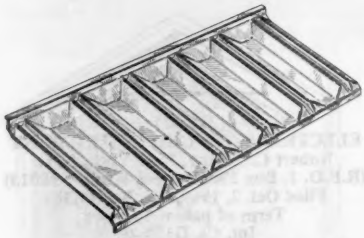
**221,482**
**PLAQUE MAGNIFIER**
St. Barth Alaska, 3811 Scoville Ave., Berwyn, Ill. 60402
Filed May 1, 1970, Ser. No. 22,774
Term of patent 14 years
Int. Cl. D16—*08;* D11—*99*
U.S. Cl. D57—1



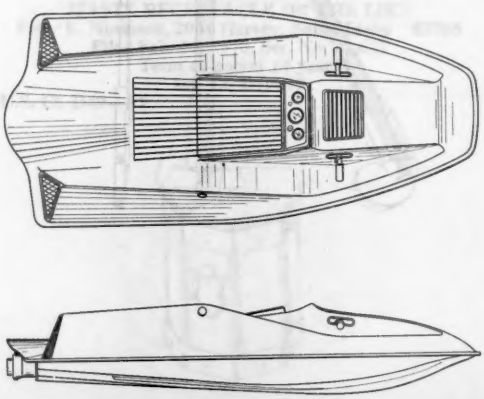
**221,483**
**PUMP BODY**
Robert F. Rasmussen, 3800 56th Ave. N., Minnneapolis, Minn. 55429
Filed Mar. 25, 1970, Ser. No. 22,042
Term of patent 14 years
Int. Cl. D15—*02*
U.S. Cl. D65—1



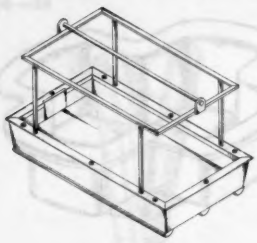
**221,484**
**ROOFING PANEL**
Jan Hendricus Zylstra, Auckland, New Zealand, assignor to Alex Harvey Industries Limited, Panmure, Auckland, New Zealand
Filed Sept. 16, 1969, Ser. No. 19,161
Claims priority, application New Zealand Mar. 31, 1969
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D68—1



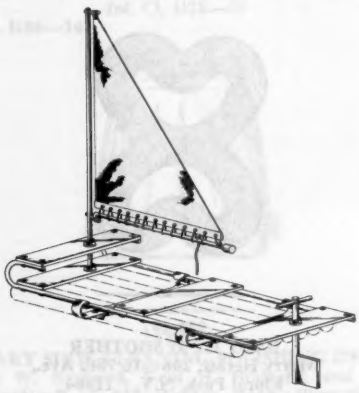
**221,485**
**SINGLE OCCUPANT POWER BOAT**
Claude H. Hutcheson, Jr., and Peter A. Ligozio, Rochester, N.Y., assignors to Aquasonics Incorporated, Rochester, N.Y.
Filed Mar. 26, 1970, Ser. No. 22,065
Term of patent 14 years
Int. Cl. D12—*06*
U.S. Cl. D71—1



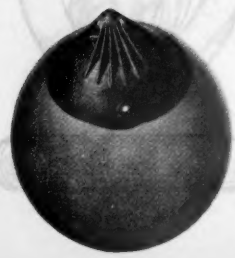
221,486
BOAT
Dale E. Cooper, Main at Boise, Emmett, Idaho 83617
Filed May 15, 1970, Ser. No. 23,022
Term of patent 14 years
Int. Cl. D12—*06*
U.S. Cl. D71—1



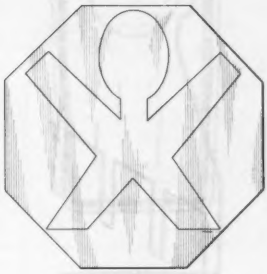
221,487
SAILING FRAME STRUCTURE
Ole Goodman, 205 McGraw St., Seattle, Wash. 98109
Filed Mar. 30, 1970, Ser. No. 22,129
Term of patent 14 years
Int. Cl. D12—*06*
U.S. Cl. D71—1



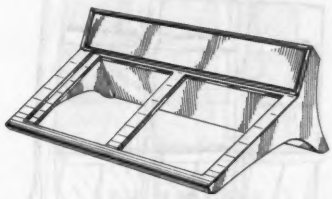
221,488
INFLATABLE BUOYANT BODY FOR MARINE USE
Knut Beyer-Olsen and Otto Steffenssen, Aalesund, Norway
Filed Sept. 19, 1969, Ser. No. 19,216
Claims priority, application Norway Mar. 24, 1969
Term of patent 14 years
Int. Cl. D12—*14*
U.S. Cl. D71—1



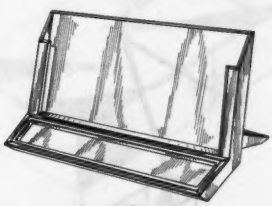
221,489
VEHICLE WARNING SIGN
Robert K. Stortz, 16230 Cumberland Trail, Brookfield, Wis. 53005
Filed Aug. 7, 1970, Ser. No. 24,369
Term of patent 14 years
Int. Cl. D29—*02*
U.S. Cl. D72—1



221,490
DESK CALENDAR HOLDER
Henry Finkel, Westmount, Quebec, Canada, assignor to W. L. Plastics and Metal Producers Co., Ltd.
Filed Feb. 26, 1970, Ser. No. 21,644
Term of patent 14 years
Int. Cl. D19—*03*
U.S. Cl. D74—5

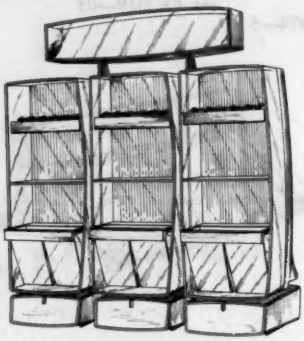


221,491
DESK CALENDAR HOLDER
Henry Finkel, Westmount, Quebec, Canada, assignor to W. L. Plastics and Metal Producers Co., Ltd.
Filed Feb. 26, 1970, Ser. No. 21,645
Term of patent 14 years
Int. Cl. D19—*03*
U.S. Cl. D74—5



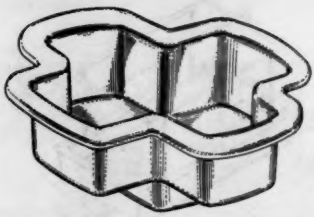
221,492
HANGER FOR CLIP-ON TIES
Larman D. Johnson, 1718 N. 17th, Boise, Idaho 83702
Filed June 29, 1970, Ser. No. 23,718
Term of patent 14 years
Int. Cl. D6—*07*
U.S. Cl. D80—8

221,493
MERCHANDIZING DISPLAY STAND
Frank H. Stephens, Jr., Dunwoody, Ga., assignor to Scripto Inc.
Filed Oct. 3, 1969, Ser. No. 19,404
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D80—9



221,494
SHOE DISPLAY BRACKET
Angelo R. Puddu, New York, N.Y. (55 Berry St., Brooklyn, N.Y. 11211)
Filed Jan. 6, 1970, Ser. No. 20,782
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D80—10

221,495
HYDROTHERAPY POOL
David K. Cavenah, Los Angeles, Calif. (4238 Shady Glade Ave., P.O. Box 1174, Studio City, Calif. 91604)
Filed May 14, 1970, Ser. No. 22,988
Term of patent 14 years
Int. Cl. D23—*02;* D24—*02*
U.S. Cl. D83—1

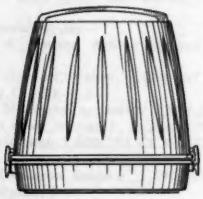


221,496
BABY GUM SOOTHER
Murry Herbst, 266—16 78th Ave., Floral Park, N.Y. 11004
Filed Mar. 11, 1970, Ser. No. 21,866
Term of patent 14 years
Int. Cl. D24—*05;* D21—*02*
U.S. Cl. D83—8

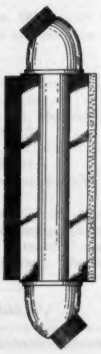
221,497
BABY GUM SOOTHER
Murry Herbst, 266—16 78th Ave., Floral Park, N.Y. 11004
Filed Mar. 11, 1970, Ser. No. 21,862
Term of patent 14 years
Int. Cl. D24—*05;* D21—*02*
U.S. Cl. D83—8

221,498
**BOOT TREE**
Norman P. Goldberg, Denver, Colo., assignor to Goldburg Plastics, Inc., and Porter Shoes, Inc., both of Denver, Colo., fractional part interest to each
Filed Feb. 25, 1970, Ser. No. 21,629
Term of patent 14 years
Int. Cl. D3—*99*
U.S. Cl. D86—10

221,499
**HAIR DRYER**
Monte L. Levin, New York, N.Y., assignor to Scovill Manufacturing Company, Waterbury, Conn.
Filed July 17, 1970, Ser. No. 24,000
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D86—10



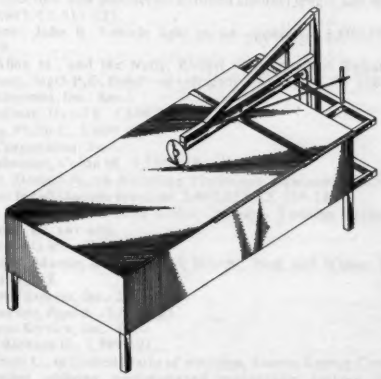
221,500
**UNITARY SHOE CLEANING-POLISHING DEVICE**
Andrew W. Brainerd, Kent H. Brainerd, and Stuart Brainerd, all of 630 Walden Road, Winnetka, Ill. 60093
Filed May 21, 1970, Ser. No. 23,076
Term of patent 14 years
Int. Cl. D4—*01*
U.S. Cl. D86—11



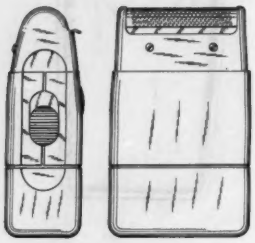
221,501
**PROTECTIVE SHEATH FOR A DRY SHAVER**
Florian Seiffert, Glashutten, Taunus, Germany, assignor to Braun A.G., Frankfurt am Main, Germany
Filed June 8, 1970, Ser. No. 23,352
Claims priority, application Germany Dec. 12, 1969
Term of patent 14 years
Int. Cl. D3—*99*
U.S. Cl. D87—1

221,502
**UMBRELLA HANDLE**
Heinz Weber, Hilden, Germany, assignor to Telesco Brophey Limited, Quebec, Canada
Filed Dec. 16, 1969, Ser. No. 20,523
Claims priority, application Germany Sept. 5, 1969
Term of patent 14 years
Int. Cl. D3—*03*
U.S. Cl. D88—3

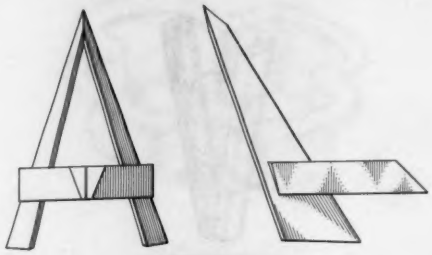
221,503
**PANEL SLITTER**
George E. Kunkle, Jr., Mesquite, Tex. (P.O. Box 83211, Fort Worth, Tex. 76112)
Filed Feb. 13, 1970, Ser. No. 21,430
Term of patent 14 years
Int. Cl. D15—*05*
U.S. Cl. D93—3



221,504
**DRY SHAVER**
Florian Seiffert, Glashutten, Taunus, Germany, assignor to Braun Aktiengesellschaft, Frankfurt am Main, Germany
Filed June 8, 1970, Ser. No. 23,354
Claims priority, application Germany Dec. 12, 1969
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D95—3



221,505
**SIGN STRUCTURE**
Robert J. Roston, New York, N.Y., assignor to City of Anaheim
Filed May 26, 1970, Ser. No. 23,161
Term of patent 14 years
Int. Cl. D20—*03*
U.S. Cl. D96—12



# LIST OF PATENTEES

## TO WHOM

## PATENTS WERE ISSUED ON THE 17TH DAY OF AUGUST, 1971

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

50% Graceffo, Helida R.: *See—*
Graceffo, Joseph A., 3,599,332.

A-T-O Inc.: *See—*
Sievenpiper, Donald A., 3,599,675.

AB Kalle-Regulatorer: *See—*
Gustafsson, Berth Ulrik, 3,599,674.

Abbenante, Thomas J.; Giesler, Victor H.; Montgomery, Robert E.; and Weiss, Gerhard T., to Corometrics Medical Systems, Inc., mesne. Fetal heart rate and intra-uterine pressure monitor. 3,599,628, Cl. 128-2.06

Abbott, Earl: *See—*
Reeves, John F., 3,599,561.

Abbott, Howard M., Jr., to Perkin-Elmer Corporation, The. Ignitor apparatus. 3,600,119, Cl. 431-67.

Abbott, Terence Arnold; Clachan, Margaret Loudon; Kennedy, David Rankine; and Shephard, Basil Robert, to Bexford Limited. Synthetic film materials. 3,600,208, Cl. 117-7.

Abbott, Thomas I.; and Woodward, Robert N., to Eastman Kodak Company. Liquid amides as silver halide developer solvents. 3,600,177, Cl. 96-76.

Abdou, John J., Jr.: *See—*
Puzas, Vitold S.; and Abdou, John J., Jr.,3,600,538.

Abraham, James M., to Auto Magic Car Wash Corporation, mesne. Car wash. 3,599,650, Cl. 134-123.

Ace Explosives Ltd.: *See—*
Graham, Stanley T.; and Rintoul, Gordon Robert, 3,599,567.

ACF Industries, Incorporated: *See—*
Yurkoski, Frank R.; and De Frank, Philip J., 3,599,575.

Acker, Norbert K., to Scanner, Inc. Apparatus for machine reading randomly positioned and oriented information. 3,600,556, Cl. 235-61.11

Acme-Cleveland Corporation: *See—*
Bourassa, Hugh A.; Emser, Arthur H.; and Ptak, Edward J., 3,599,778.

Adair, Lowell E.; and Gusdorf, Walter, to Gusdorf & Sons, Inc. Table assembly. 3,599,580, Cl. 108-153.

Adamczyk, Edward S. Measuring apparatus. 3,599,339, Cl. 33-172.

Adler, Robert; and De Vries, Adrian J., to Zenith Radio Corporation. Acoustic surface wave filter. 3,600,710, Cl. 333-72.

Advance Dye Systems: *See—*
Getz, John L.; and Johnson, Ralph L., 3,599,451.

Advance Machine Company: *See—*
Arones, Daniel A., 3,600,100.

Aelterman, Marcel Frans; and Meeussen, Louis Achilles, to Gevaert-Agfa. Method and apparatus for viscous processing. 3,599,554, Cl. 95-89.

Aerojet-General Corporation: *See—*
Kromrey, Robert V., 3,599,430.
Walker, Lloyd A.; and Peterson, Rudolph A., 3,600,486.

Aeromarine Corporation: *See—*
Carter, John Henry, 3,599,937.

Agfa-Gevaert Aktiengesellschaft: *See—*
Durr, Helmut; Klepek, George; and Vesper, Rainer,, 3,599,545.
Hennig, Fridolin, 3,599,548.
Lemme, Gerhard, 3,599,551.
Matejec, Reinhard; Meyer, Rudolf; and Mucke, Bruno, 3,600,182.
Wagner, Karl, 3,599,547.
Winkler, Alfred, 3,600,075.

Ahrens, Claude Wesley. Playground swing apparatus. 3,599,973, Cl. 272-30.

Aidlin, Samuel A.; and Aidlin, Stephen H. Hopper-type apparatus for orienting and feeding bottle and jar caps, or the like. 3,599,829, Cl. 221-160.

Aidlin, Stephen H.: *See—*
Aidlin, Samuel A.; and Aidlin, Stephen H.,3,599,829.

Air Products and Chemicals Inc.: *See—*
Holland, Dewey G.; Moyer, Ronald C.; Polevy, John H.; and Walde, Robert A., 3,600,433.
Huntzinger, Elwood E., 3,600,266.
Spector, Marshall L., 3,599,610.
Tedeschi, Robert J.; and Natali, Paul W., 3,600,321.

Akazome, Giichi: *See—*
Murai, Koichi; Akazome, Giichi; Murakami, Yasuto; Tabata, Koichi; Oka, Yoshio; and Fujita, Akira,3,600,356.

Akgulian, Sahag C.; Haffner, Donald G.; and Heth, Sherman C., to Jacobsen Manufacturing Company. Tractor-supported lawn mower. 3,599,406, Cl. 56-26.

Aktiebolaget Bofors: *See—*
Skagerlund, Lars-Erik, 3,600,072.

Aktiebolaget Electrobux: *See—*
Ljung, Hans Georg; and Palmeth, Torsten Birger, 3,599,271.

Aktiebolaget Kamyr: *See—*
Richter, Johan C. F. C., 3,599,449.

Aktiengesellschaft Brown, Boveri & Cie: *See—*
Anwander, Elmar, 3,600,662.

Alberto, Delfin Perez: *See—*
Fernandez, Carlos Manuel Cruz; Valdes, Rogelio Rodriguez; and Alberto, Delfin Perez,3,599,404.

Albright, Donald E., to Minnesota Mining & Manufacturing Company. Test analyzer. 3,599,349, Cl. 35-48.

Alburn, Harvey E.: *See—*
Grant, Norman H.; and Alburn, Harvey E.,3,600,426.

Alcock, Richard A.; Johnston, Robert B.; and Guthrie, Robert M., to Fastener Engineers, Inc. Wire drawing and feeding apparatus. 3,599,468, Cl. 72-287.

Aldera, Adolfo, to Centro Sperimentale Metallurgico Societa per Azioni. Fluidized molding material for manufacturing cores and molds and a method therefor. 3,600,203, Cl. 106-38.3

Alderman, Lewis, to Simon-Carves Limited. Process for the treatment of coal to render it suitable for use in coke oven. 3,599,885, Cl. 241-17.

Aldrich Chemical Company, Inc.: *See—*
Graeve, Rolf Ernst; Pociask, Joseph Robert; and Stein, Robert George, 3,600,393.

Aldridge, Clyde L.; and Waghorne, Robert H., to Esso Research and Engineering Company. Desulfurization of fluid petroleum coke. 3,600,130, Cl. 23-209.9

Alessi, Samuel P., to Borg-Warner Corporation. Hard facing alloy composition and method of manufacture. 3,600,201, Cl. 106-1.

Alexander, John A., to TRW Inc. Filament lamellae forming apparatus. 3,599,291, Cl. 18-30.

Allan, George G., to Weyerhaeuser Company. Method of clarifying aqueous suspensions with polymerized lignin derivatives. 3,600,308, Cl. 210-52.

Allen, Robert J., to Ex-Cell-O Corporation. Container blank variable speed feeder apparatus. 3,599,541, Cl. 93-53.

Allen, Robert J.; Martin, Philip C.; and Neumayerm, Jack M., to Ex-Cell-O Corporation. Automatic container ejector apparatus. 3,599,391, Cl. 53-186.

Allen-Bradley Company: *See—*
Riley, Richard E., 3,600,652.

Allied Chemical Corporation: *See—*
Kushnick, Julian H., 3,599,528.
Lohr, Thomas E., 3,600,037.
Stewart, Aubrey P., Jr.; and Freemyer, Gene J., 3,600,191.
Sweeney, Richard F.; and Price, Alson K., 3,600,415.
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Allis-Chalmers Manufacturing Company: *See—*
Goodwin, Edwin C., Jr., 3,600,541.
Langford, Le Roy, 3,599,741.
Moe, Richard G.; Sieren, Gerald E.; and Walberg, Maynard E., 3,599,728.
Pollak, Robert J., 3,599,883.
Puzas, Vitold S.; and Abdou, John J., Jr., 3,600,538.
Sabaski, Richard E.; and Heins, Roger A., 3,599,882.

Allison, David F.; and Russell, Lewis K., to Signetics Corporation. MOS structure with precisely controlled channel length and method. 3,600,642, Cl. 317-235.

Aloisantoni, John R. Vehicle light switch apparatus. 3,600,596, Cl. 307-10.

Alper, Allen M.; and Mc Nally, Robert N., to Corhart Refractories Company. $MgO$-$P_2O_5$ fused cast refractory. 3,600,206, Cl. 106-58.

Alpha Industries, Inc.: *See—*
Friedman, David S., 3,600,707.
King, Philip E., 3,600,708.

Alprod Corporation: *See—*
Stephenson, Colon M., 3,599,846.

Altergott, Donald R., to American Photocopy Equipment Company. Counter for photocopy machine. 3,600,085, Cl. 355-14.

Altmann, Conrad, to Eastman Kodak Company. Loading mechanism. 3,599,682, Cl. 141-106.

Aluminium AG Menziken: *See—*
Landolf, Martin; Roth, Rudolf; Buechi, Paul; and Weber, Peter, 3,599,893.

Aluminum Textures, Inc.: *See—*
Chenevier, Paul A., 3,599,465.

Alves Photo Service, Inc.: *See—*
Lee, Richard G., 3,599,521.

Alvis, Robert L., to United States of America, Atomic Energy Commission. Joint utilizing wedge-shaped rectangular locking shafts. 3,600,011, Cl. 285-305.

American Can Company: *See—*
Gitchel, Wayne Benjamin; Diddams, Donald Guy; and Hoffman, Clarence Anthony, 3,600,442.
Godar, Joseph Lambert, Jr., 3,600,347.

American Coldset Corporation: *See—*
Thompson, Charles T., 3,599,736.

American Cyanamid Company: *See—*
Berkelhammer, Gerald; Gastrock, William Henry; Remers, William Alan; Tomcufcik, Andrew Stephen; and Weiss, Martin Joseph, 3,600,399.
Glick, Arthur; and McCusker, Edward Joseph, 3,600,223.
Loffelman, Frank; and Konzelman, Leroy Michael, 3,600,385.

American Filtrona Corporation: *See—*
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Anders, Gerhard; and Jung, Werner, to Hamac-Hansella GmbH. Method of and apparatus for mixing liquid to a viscous mass. 3,599,938, Cl. 259-7.

Anderson, Carl P., to SCM Corporation. Platen linespacing mechanism. 3,599,774, Cl. 197-114.

Anderson, Douglas, to Chapman, Dave Goldsmith & Yamasaki, Inc. Plastic dispensing container and closure therefor. 3,599,837, Cl. 222-107.

Anderson, George de W.; and Stehle, Grahame J., to Minnesota Mining and Manufacturing Company. Argentohalide complex film construction. 3,600,175, Cl. 96-65.

Anderson, Keith D., to Unites States of America, Army, mesne. Chemo-mechanical timer. 3,599,419, Cl. 58-1.

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Arbini, Anthony J., to McCormick & Company Inc. Dispenser for chopped vegetables having rotary blade agitator. 3,599,793, Cl. 210-152.

Arbuckle, Timothy, to Computer Modern Corporation. Nonlinear equalization system including self-and cross-multiplication of sampled signals. 3,600,681, Cl. 325-42.

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Armbruster, Ronald Herman David; and Nelsen, Roger Jacob, to Gulf & Western Industrial Products Company, mesne. Electric welder for can body seams. 3,600,545, Cl. 219-64.

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Lawton, William R., 3,600,169.
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Bauer, Ralph H.; and Shaw, Alfred W., to Shell Oil Company. Solvent resistant vinyl-pyridine block polymer derivatives and their preparation. 3,600,464, Cl. 260-879.
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Berler, Robert M., to Pitney Bowes-Alpex, Inc. Hand held printed ticket reader comprising a rectilinearly moving scanning lens. 3,600,593, Cl. 250-219.
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Bernholdt, Harry F.; and Roschen, Harry L., to Swift & Company. Method of preserving frozen fresh red meat. 3,600,200, Cl. 99-194.
Berninger, Carl Johannes; and Fitzpatrick, Joseph William, to Toms River Chemical Corporation. 1-Hydroxy-4-sulfonamidoanilinoanthraquinone disperse dyes. 3,600,410, Cl. 260-373.
Berry, Robert F., to Dresser Industries, Inc. Gas lift system. 3,600,105, Cl. 417-132.
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Bohme, Reinhard D., to Dow Chemical Company, The. Adhesive blend comprising an ethylene/unsaturated acid copolymer and an ethylene/unsaturated ester copolymer. 3,600,468, Cl. 260-897.
Bohn, Donald I. Quick response recording thermometer. 3,599,491, Cl. 73-349.
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Bowen, Thomas R. Varifocal beam spreader. 3,600,063, Cl. 350-167.
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Slator, Damon T.; Lee, William T.; and Peil, Archie W., 3,599,735.
Bowers, Raymond G.: *See*—
Turner, Charles R., III; Bowers, Raymond G.; Smith, Clyde R.; Behrman, Paul C., Jr.; and Cummings, James A.,3,599,765.
Bowler, William; and Kalita, Raymond E., to Canadian National Railway Company. Automatic railway car journal oiler. 3,599,752, Cl. 184-3.
Bowman, Robert G.; and Woodyard, John B., to Gibson, C. R., Company, the. Display frame for photos or the like. 3,599,361, Cl. 40-156.
Boyer, Charles Benjamin, to Crucible Inc. Heat insulating casing. 3,599,281, Cl. 18-5.
Boyriven, Paul, to C.I.M. (Compagnie Industrielle de Mecanismes). Door lock. 3,600,024, Cl. 292-226.
Bozzelli, Gilbert J.: *See*—
Skehan, Michael J.; Gerbeth, Gerhart L.; Bozzelli, Gilbert J.; and Milliken, Paul E.,3,599,698.
Brackbill, Warren H.; and Buck, Ernest E., to Sperry Rand Corporation. Liquid manure retainer. 3,599,870, Cl. 239-220.
Brackelmanns, Norbert William; and Ollendorf, Joel, to RCA Corporation. Power transistor. 3,600,646, Cl. 317-234.
Brackman, Donald A., to Avco Corporation. Safing and arming system for a munition. 3,599,572, Cl. 102-70.2
Bradshaw, Christopher Patrick Cadman, to British Petroleum Company Limited, The. Production of $C_7$-$C_{30}$ olefins. 3,600,456, Cl. 260-683.
Brady, Donnie G., to Phillips Petroleum Company. Polyesters from polycarboxylates and polyhalides. 3,600,365, Cl. 260-78.4
Brafford, Donald A., to Beloit Corporation. Roll composition. 3,599,306, Cl. 29-132.
Bragole, Robert A., to USM Corporation. Treatment of resin surfaces to improve adhesive bonding, resin bodies with treated surfaces and adhesive process. 3,600,289, Cl. 204-159.14
Brain, Alfred E.: *See*—
Newgard, Peter M.; and Brain, Alfred E.,3,600,507.
Brain, Charles H.: *See*—
Gedge, Burton H. III; and Brain, Charles H.,3,600,319.
Brainard, Maurice W. Releasable magnetic latch. 3,600,025, Cl. 292-251.5
Bramati, Angelo; and Pierlornzi, Paolo. Water closet seat cleaning device. 3,599,246, Cl. 4-233.
Branson Instruments, Incorporated: *See*—
Clarke, William F., 3,600,613.
Brauner, Shlomo. Method of producing synthetic stone members simulating mosaics. 3,600,485, Cl. 264-74.
Bravin, Ben. Zero backlash, low friction linear-rotary translator. 3,599,500, Cl. 74-89.15

Braxton Corporation: *See—*
Horsley, Caperton B., 3,599,748.

Breen, Joseph, to RCA Corporation. Method of making laminated semiconductor devices. 3,600,246, Cl. 156-64.

Breitenmoser, Max: *See—*
Feier, Kurt; Werthmuller, Hans; and Breitenmoser, Max,3,599,565.

Brenner, Kenneth I.: *See—*
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Breton, Jean Claude, to Compagnie de Saint-Gobain. Boric oxide-free glass fibers and compositions for making them. 3,600,205, Cl. 106-50.

Brickner, Kenneth G.; and Ludwigson, David C., to United States Steel Corporation. Metastable austenitic stainless steel. 3,599,320, Cl. 29-527.7

Brigalli, Anthony J., to United States of America, Air Force. Hypersonic wind tunnel throat plug. 3,599,487, Cl. 73-147.

Briggs, Leonard A.; Morton, Harold; and Swiderski, Jan, to Butec Limited, and Oldham & Son Limited. Temperature compensated and protected battery charging apparatus. 3,600,661, Cl. 320-35.

Bright, Alfred William; Makin, Brian; Rogers, Michael Edward; and Whewell, Bruce Robert, to United Kingdom of Great Britain and Northern Ireland, Minister of Technology in Her Britannic Majesty's Government of the. Static electricity discharge systems. 3,600,632, Cl. 317-2.

Bril, Alfred; and Wanmaker, Willem Lambertus, to U.S. Philips Corporation, mesne. Terbium activated strontium ortho-phosphate phosphor. 3,600,324, Cl. 252-301.4

Brinkhoff, Hans, to Spezialchemie Gesellschaft mit Beschankter Haftung & Co. Hydrogenation of pyrone compounds. 3,600,403, Cl. 260-343.5

Brinkmann, Ludwig; and Frohlich, Helmut, to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning. Thermoplastic reaction product of a linear saturated polyester and a polyalkylenediol. 3,600,460, Cl. 260-860.

British Aircraft Corporation: *See—*
Ransom, Stephen; and Bainbridge, William N., 3,599,907.

British Insulated Callender's Cables Limited:*See—*
Atherton, James; and Goodfellow, David Sydney, 3,599,890.

British Iron and Steel Research Association, The: *See—*
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British Petroleum Company Limited, The: *See—*
Bradshaw, Christopher Patrick Cadman, 3,600,456.
Hunter, Philip John, 3,600,332.

Broecker, Bernhard; and Kiessling, Hans-Joachim, to Reichhold-Albert-Chemie Aktiengesellschaft. Hydrophylic air drying synthetic resins that are useful as binders in water-dilutable lacquers and their method of preparation with boron and its oxygen containing compounds. 3,600,344, Cl. 260-19.

Broeren, Thomas E.: *See—*
Nystrand, Ernst Daniel; and Broeren, Thomas E.,3,599,293.

Broken Hill South Limited: *See—*
Buck, Basil Alfred, 3,599,287.

Brooker, Leslie G.S.; and Oliver, Gene L., to Eastman Kodak Company. Silver halide photographic materials sensitized with a methine dye having an isoindolo[2,1-a]benz- imidazol-11-yl moiety. 3,600,184, Cl. 96-129.

Brooks, Elwin W.: *See—*
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Brooks, Robert E.: *See—*
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Brotherton, Thomas K.; Lynn, John W.; and Smith, John, Jr., to Union Carbide Corporation. Polyhaloformates. 3,600,421, Cl. 260-463.

Brouwer, Charles W.; Cowan, Larry C.; and Horton, Robert, to Leesona Corporation. Bobbin seating and removing apparatus and method. 3,599,892, Cl. 242-130.

Brown & Root, Inc.: *See—*
Lochridge, Joe C.; and Rochelle, William R., 3,599,436.

Brown, George R.: *See—*
Craven, Walter Scott; and Brown, George R.,3,599,408.

Brown, Jack E., to Halliburton Company. Method and apparatus for providing clean perforations in a well bore. 3,599,719, Cl. 166-297.

Brown, Kenneth J. Hog skinning. 3,599,277, Cl. 17-21.

Brown, Kenneth Robson; Crawford, Charles Ian; and Reid, Erskine Robert, to Ferranti, Limited. Systems for gyroscopically stabilising and controlling equipment mounted or vehicles. 3,599,495, Cl. 74-5.34

Brown, Lynne P.: *See—*
Goodman, Jack L.; Brown, Lynne P.; and Podesta, Dorothy A.,3,600,087.

Brown, Ronald E.; and Garfinkle, David R., to Whittaker Corporation. Self-calibrating heat flux transducer. 3,599,474, Cl. 73-1.

Brown, Victor: *See—*
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Brown, William J.: *See—*
Kaufman, Karl L.; Martin, Doris N.; and Brown, William J.,3,600,325.

Brownfield, Keith E., to Warner & Swasey Company. Material handling vehicle. 3,599,814, Cl. 214-141.

Brownlee, Wilbur H. Pipe fitting securing tool. 3,599,310, Cl. 29-237.

Bruning Company: *See—*
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Brunozzi, Lorenzo: *See—*
Berman, Icchok Majer; Brunozzi, Lorenzo; and DeGuire, Rejean,3,599,583.

Brunswick Corporation: *See—*
Richardson, Jack Y., 3,599,571.

Bucheli, Josef, to Tuflex AG. Anchoring device for securing objects to a C-cross section bar. 3,599,693, Cl. 151-41.75

Buchner, Hans, to Pfagg, G. M., AG. Electric ironing machine. 3,599,356, Cl. 38-59.

Buck, Basil Alfred, to Broken Hill South Limited. End forming tool for thermoplastic tubing. 3,599,287, Cl. 18-19.

Buck, Ernest E.: *See—*
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Buck, Wolfgang: *See—*
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Buckbee-Mears Company: *See—*
Arndt, Lloyd G., 3,600,213.
Hedlund, Harland R.; Wethe, Harry K.; and Turner, Vernon L., 3,599,851.

Buckman, Wayne T.: *See—*
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Budai, Robert E.; and McDowell, Philip R., to G & B Automated Equipment Limited. Machine for use in the manufacture of grinding wheels. 3,599,283, Cl. 18-5.

Buechi, Paul: *See—*
Landolf, Martin; Roth, Rudolf; Buechi, Paul; and Weber, Peter,3,599,893.

Bukac, Zbynek; Tomka, Jiri; and Sebenda, Jan, to Ceskoslovenska Akademie ved. Method of manufacturing polyamides by alkaline polymerization of lactams having an at least 7-membered ring. 3,600,360, Cl. 260-78.

Bull, John K. Non-shrink grout mixture. 3,600,207, Cl. 106-87.

Bunawerke Huls Gesellschaft mit beschrankter Haftung: *See—*
Schaum, Helmut; Emde, Hans; and Benedikter, Kurt, 3,600,368.

Bunker-Ramo Corporation, The: *See—*
Foerster, Roy P., 3,600,598.
Richter, Gunther M., 3,600,542.

Buno, David G.; and Fletcher, General C. Vacuum regulator for engine automatic transmission. 3,599,513, Cl. 74-877.

Bunting, Charles W.: *See—*
Humphrey, Paul G.; and Bunting, Charles W.,3,599,965.

Burgess & Associates, Inc.: *See—*
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Burgess, Warren C., Jr., to Burgess & Associates, Inc. Disentangling device for separating entangled parts. 3,599,783, Cl. 198-220.

Burnett, Richard T.: *See—*
Schultz, Harold B.; Fulmer, Keith H.; and Burnett, Richard T.,3,599,761.

Burr, Robert Page, to Photo-Circuits Corporation. Machine for making wire-wound disc armatures. 3,599,680, Cl. 140-92.2

Burr, Robert P.; and Keogh, Raymond J., to Photocircuits Corporation. Method of making laminated wire wound armatures. 3,599,325, Cl. 29-597.

Burroughs Corporation: *See—*
Cake, Arthur F., 3,600,631.
Goldschmied, Sandor, 3,599,877.
Kupsky, George A., 3,600,626.

Bursack, Kenneth F.; and Oldham, Millard L., to Frontier Chemical Company, division of Nulcan Materials Company. Liquid preservative composition which contains pentachlorophenol. 3,600,408, Cl. 424-347.

Busch, Hans: *See—*
Feinauer, Roland; Seeliger, Wolfgang; Van Brunswijk, Johann Schlimme; and Busch, Hans,3,600,214.

Buschbom, Floyd E.; and Hansen, Glen D., to Van Dale Corporation. Distributor apparatus. 3,599,878, Cl. 239-665.

Buser, Fritz, AG., Firma: *See—*
Feier, Kurt; Werthmuller, Hans; and Breitenmoser, Max, 3,599,565.

Busey, Harold M., to McDonnell Douglas Corporation. Earthquake resistant nuclear reactor station. 3,599,589, Cl. 114-0.5

Busker, Leroy H.: *See—*
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Butec Limited: *See—*
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Butts, Orville R.; Dorner John R.; and Hanisco, Raymond L., to Proctor-Silex Incorporated. Ironing table with magnetic keeper for iron. 3,599,358, Cl. 38-107.

Bykov, Leonid Alexandrovich; Gelfenbein, Evgeny Jukhimovich; and Litvinov, Anatoly Ivanovich. Apparatus for flame cutting of metal. 3,599,948, Cl. 266-23.

Cake, Arthur F., to Burroughs Corporation. Optional high voltage booster circuit for indicator tube. 3,600,631, Cl. 315-169.

Calandra, Sam S. Razor and comb holder. 3,599,327, Cl. 30-30.

Caldwell, John P.: *See—*
Chawda, Prabhulal P.; Caldwell, John P.; and Kramer, William E.,3,599,604.

Callan, John G., to Knox, Inc. Web registry control apparatus. 3,599,849, Cl. 226-22.

Campbell, Gabe L.; and Johnson, Henry A., to United States of America, Air Force. Production of hollow ball or roller bearings by swaging or other compressive method. 3,599,307, Cl. 29-148.4

Campbell, Hugh J. E., to Ontario Research Foundation. Modification of cellulosic textile materials with formaldehyde and cyanomide using ammonium salt catalysts. 3,600,123, Cl. 8-116.3

Campbell, John J.: *See—*
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Canadian National Railway Company: *See—*
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Canadian Patents and Development Limited: *See—*
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Canevari, Roger: *See—*
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Canon Camera Kabushiki Kaisha: *See—*
Tosaka, Umi; Sano, Yozo; Matsuo, Takehiko; Negishi, Hirokazu; Ikuta, Tamao; Yamaguchi, Masaru; and Hattori, Setsuko, 3,600,256.

Caputo, William R.; and Ostrander, William M., to Westinghouse Electric Corporation. Motor control system. 3,599,754, Cl. 187-29.

Carder, Victor H.; Green, Sheldon K.; and Wood, Christopher R., to Cochran Western Corporation. Attitude sensing system for use during loading and unloading of vehicles. 3,599,262, Cl. 14-71.

Carey, William R., to Eaton Yale & Towne, Inc. Vehicle safety system. 3,600,003, Cl. 280-150.

Carleton, James T.; and Putman, Richard E., to Westinghouse Electric Corporation. Control system for coating continuous webs. 3,599,600, Cl. 118-8.

Carlson, Arthur P. Fishing device. 3,599,369, Cl. 43-17.

Carlson, John D.; Lawrence, Jack C.; and Weideman, James P., to Koppers Company, Inc. Roof deck assembly. 3,599,384, Cl. 52-309.

Carpenter, Willard D.; and Schuller, Eduard, to Telefunken Patentverwertungsgesellschaft m.b.H. United States of America, Navy. Apparatus for reconstructing speech generated in Reproduction process for magnetic tapes an abnormal gas atmosphere. 3,600,523, Cl. 179-15.

Carpentier, Serge; Dajlevic, Radovan; Delarue, Roger; Francois, Henri; Portal, Guy; Pradel, Jacques; and Soudain, Georges, to Commissariat a l'Energie Atomique. Thermal luminescent material for ionizing radiation dosimetry. 3,600,579, Cl. 250-71.

Carroll, Noble L., Jr. Boat with running gear. 3,599,256, Cl. 9-1.

Carroll, Thomas P., Sr. Combination tool. 3,599,255, Cl. 7-8.1

Carter, Ernest P., to Monsanto Company. Inextensible filamentary structure and fabrics woven therefrom. 3,599,679, Cl. 139-420.

Carter, Forrest L.; and Sadler, Walter C. Goniometer device. 3,600,576, Cl. 250-51.5

Carter, John Henry, to Aeromarine Corporation. Winch. 3,599,937, Cl. 254-150.

Cartmell, James V.: *See—*
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Carver, Richard N.; and Hubiak, Walter, to Marx, Louis & Co., Inc. Toy vehicle propulsion unit. 3,599,365, Cl. 46-202.

Cassidy, Harold G.; Wegner, Gerhard; and Nakabayashi, Nobuo, to Research Corporation. Redox polyester polymers. 3,600,411, Cl. 260-396.

Caterpillar Tractor Company: *See—*
Freese, Gary P., 3,599,506.
Kiwalle, Jozef; and Lamb, Frederick M., 3,599,998.
Loyd, Calvin D.; Oberle, Theodore L.; Sage, Ira H.; and Satzler, Ronald L., 3,599,857.
Stafford, Warren J., 3,600,012.
Totz, Clayton J., 3,599,813.

Cates, Joseph A.; and Sebastian, William H., to International Business Machines Corporation. Automatic photoconductor advance mechanism for a xerographic copying machine. 3,600,086, Cl. 355-16.

Cavanaugh, George F. Photo-composing apparatus. 3,599,544, Cl. 95-4.5

Cavolina, Thomas: *See—*
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Caywood, William P., Jr., to United States of America, Army, mesne. Synchronous demodulator. 3,600,691, Cl. 328-133.

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Jamison, Saunders E., 3,600,458.
Levine, Eli; and Singer, Robert F., 3,600,345.
Martin, Preston K.; and Bland, Bobby J., 3,600,430.
Taylor, Wallace Edmondson; and Witt, Erique Roberto, 3,600,431.

Celmer, Blase G.: *See—*
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Centre Electronique Horloger S.A.: *See—*
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Centre Electronuque Horloger S.A.: *See—*
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Centro Sperimentale Metallurgico Societa per Azioni: *See—*
Aldera, Adolfo, 3,600,203.

Ceskoslovenska Akademie ved: *See—*
Bukac, Zbynek; Tomka, Jiri; and Sebenda, Jan, 3,600,360.

Cevidalli, Guidobaldo; Gurdjian, Vahan; Giordano, Nicola; and del Vesco, Adriano, to Universal Oil Products Company. Process for the catalytic oxidation of lower olefins to carbonyls and acids. 3,600,443, Cl. 260-604.

Chan, Frank L. Crystal mount and goniometer for taking laue patterns and for orientation of large single crystals. 3,600,575, Cl. 250-51.5

Chaney, Harold K.; and Strandrud, Halvor T., to Boeing Company, The. Electric fluid actuator. 3,599,428, Cl. 60-52.

Chapman, Dave Goldsmith & Yamasaki, Inc.: *See—*
Anderson, Douglas, 3,599,837.

Chawda, Prabhulal P.; Caldwell, John P.; and Kramer, William E., to Xerox Corporation. Xerographic development apparatus. 3,599,604, Cl. 118-637.

Check, Donald R., to Sports Technology, Inc. Ski boot with rigid outer shell. 3,599,351, Cl. 36-2.5

Cheiten, Samuel S. Combination brush and scraper. 3,599,263, Cl. 15-111.

Chemetron Corporation: *See—*
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Chemical Construction Corporation: *See—*
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Chen, Tai-Seng; Cook, Kenneth A.; and McDonnell, Bernard P., to Corning Glass Works. Temperature control system for a glass tank forehearth. 3,600,149, Cl. 65-162.

Chenevier, Paul A., to Aluminum Textures, Inc. Method and apparatus for forming patterns in metal panels. 3,599,465, Cl. 72-207.

Cheney, Paul E.: *See—*
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Cherry, James R., to Motorola, Inc. Overload compensation circuit for antenna tuning system. 3,600,684, Cl. 325-319.

Chevron Research Company: *See—*
Bollen, Walter M.; and Short, William Leigh, 3,600,283.
Roberts, Frederick Alexander; and Saunders, Edwin B., 3,600,674.

Chicago Tire Brick Company: *See—*
Parsons, Joseph R., 3,600,480.

Childers, Frank M. Portable traction stand. 3,599,632, Cl. 128-75.

Chisholm, James J.; and Emmel, Henry J., to Bausch & Lomb Incorporated. Multiple lamp housing and burner assembly for photometric apparatus. 3,600,571, Cl. 240-41.35

Chitra, John, Jr., to United States of America, Atomic Energy Commission. Conveyor structure. 3,600,578, Cl. 104-168.

Chorney, Peter L., to FMC Corporation. Magnetic can handling apparatus with surge and hold control. 3,599,804, Cl. 214-1.

Chow, Ho; and Chow, Junlin Wong. Key case. 3,599,458, Cl. 70-459.

Chow, Junlin Wong: *See—*
Chow, Ho; and Chow, Junlin Wong,3,599,458.

Christensen, Alton O., to Shell Oil Company. IGFET read amplifier for double-rail memory systems. 3,600,609, Cl. 307-279.

Christie, James. Carrying bag. 3,599,690, Cl. 150-11.

Chrysler Corporation: *See—*
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Churchill, Donald; and Cartmell, James V., to National Cash Register Company, The. Display device containing minute droplets of cholesteric liquid crystals in a substantially continuous polymeric matrix. 3,600,060, Cl. 315-160.

Ciba Corporation: *See—*
Druey, Jaen; and Schmidt, Paul, 3,600,389.
Schenker, Karl, 3,600,400.

Ciba Limited: *See—*
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Zickendraht, Christian; and Fasciati, Alfred, 3,600,373.

Cicci, George B.: *See—*
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C.I.M. (Compagnie Industrielle de Mecanismes): *See—*
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Cincinnati Milacron Inc.: *See—*
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Cincinnati Milling Machine Co., The: *See—*
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Cities Service oil Company: *See—*
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Clachan, Margaret Loudon: *See—*
Abbott, Terence Arnold; Clachan, Margaret Loudon; Kennedy, David Rankine; and Shephard, Basil Robert,3,600,208.

Clapton, Jefferson M.: *See—*
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Clapton, Jefferson M.; and McCready, Donald K., to Clapton, Jefferson M., and McCready, Donald K. Recovery of mercury from cinnabar. 3,600,156, Cl. 75-101.

Clark, John M., Jr.; Nye, Allan R.; and Wood, Charles D., to Southwest Research Institute. Air control system for apparatus displacing material by combustive explosions. 3,600,116, Cl. 431-1.

Clark, Norman Owen, to English Clays Lovering Pochin & Company Limited. Grinding treatment of clay. 3,599,879, Cl. 241-4.

Clark, Robert A., to Glenmore Distilleries Company. Apparatus for affixing strip stamps to bottle necks. 3,600,254, Cl. 156-477.

Clarke, William F., to Branson Instruments, Incorporated. Transducer probe for ultrasonic pulse-echo test apparatus. 3,600,613, Cl. 310-9.1

Clawson, Arthur R.: *See—*
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Clayton, Bobby J., to United States of America, Army. Negative feedback fluidic oscillator. 3,599,653, Cl. 137-81.5
Clemens, Ogden A., to Swift & Company. Sliced meat manufacture. 3,599,560, Cl. 99-355.
Clement, Carl: *See—*
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Clevite Corporation: *See—*
Reilly, Edward J., 3,600,504.
Clor, Anthony G., Jr., to Design Products Corporation. Voltage comparator. 3,600,606, Cl. 307-235.
Coach and Car Equipment Corporation: *See—*
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Cochran Western Corporation: *See—*
Carder, Victor H.; Green, Sheldon K.; and Wood, Christopher R., 3,599,262.
Coe, Peter F., to Lever Brothers Company. Apparatus for mechanically handling cylindrical articles. 3,599,779, Cl. 198-127.
Coffey, James P.; Consolloy, James W.; and Vengrofski, Frank A., to ESB Incorporated. Blow molded battery container and individual blow molded cell modules housed therein. 3,600,233, Cl. 136-134.
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Cohen, Sherman E.; and Sproat, William H., Sr., to Lockheed Aircraft Corporation. Apparatus for converting acoustic energy into a visible image. 3,599,477, Cl. 73-67.5
Cole, Roger M., to Eastman Kodak Company. Sulfonamides in diffusion transfer systems. 3,600,171, Cl. 96-29.
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Bigelis, Charles F.; Colehour, Jeffrey L.; Davidson, G Dennis; Farquhar, Bannister W.; and Heiberg, Andreas,3,599,429.
Coleman, Fred K.; and Schmid, Robert B., to Ameron, Inc., mesne. Hoisting coupler. 3,600,031, Cl. 294-88.
Coleman, John H., to Surface Aviation Corporation, mesne. Method of grafting ethylenically unsaturated monomer to a polymeric substrate. 3,600,122, Cl. 8-115.7
Collins Radio Company: *See—*
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Colomb, Gracie H. Shampoo machine. 3,599,250, Cl. 4-159.
Colorado Leisure Products, Inc.: *See—*
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Combes, Marvin G.; and Ripert, Roger L., to Grove Valve and Regulator Company. Auxiliary valve stem seal. 3,599,991, Cl. 277-9.
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Misenti, Angelo J., 3,599,498.
Commissariat a l'Energie Atomique:*See—*
Barthelemy, Pierre; and Boucher, Rene, 3,600,586.
Carpentier, Serge; Dajlevic, Radovan; Delarue, Roger; Francois, Henri; Portal, Guy; Pradel, Jacques; and Soudain, Georges, 3,600,579.
Dubouch, Claude; and Petit, Maurice, 3,599,475.
Vatin, Robert, 3,600,607.
Compagnie de Saint-Gobain: *See—*
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Compoflex Company Limited of Lumb Hill: *See—*
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Computer Modern Corporation: *See—*
Arbuckle, Timothy, 3,600,681.
Comstock, George E., to Singer Company, The. Sinuous font arrangement for a printing means. 3,599,772, Cl. 197-49.
Condeco Automation, Inc.: *See—*
Whitfield, Homer G., 3,599,782.
Condit, Philip M.; Ormiston, Robert A.; Nixon, Walter Barry; and Sweeney, Thomas E. Semi-rigid airfoil for airborne vehicles. 3,599,904, Cl. 244-38.
Condolios, Elie, to Societe Grenobloise d'Etudes et D'Applications. Hydraulic sorting apparatus. 3,599,791, Cl. 209-157.
Congdon, R. J. Max. Headlight cleaning apparatus. 3,599,269, Cl. 15-250.04
Conner, Jesse R.; and Ball, Kenneth E., to Environmental Science Inc. Method for integrating electrical signals over long time periods. 3,600,566, Cl. 235-183.
Connolly, Patrick W., to Visi-Trol Engineering Company. Composite track and method of making same. 3,599,768, Cl. 193-25.
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Continental Oil Company: *See—*
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Rounsaville, James F., 3,600,153.
Controls Company of America: *See—*
Kothe, Erich, 3,600,536.
Conway, Charles T.; and Campbell, John J. Modular carrier for such articles as tape reels. 3,599,828, Cl. 220-102.
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Chen, Tai-Seng; Cook, Kenneth A.; and McDonnell, Bernard P.,3,600,149.
Cooksey, John Andrew; McNeilly, Joseph Hood; and Manship, Roger Alan, to RCA Corporation International Standard Electric Corporation. Apparatus for controlling the operating potential of a vidicon Subscriber subset for PCM telephone system. 3,600,511, Cl. 179-15.
Cope, Geoffrey Wilton, to Dresser Industries, Inc. Automatic pneumatic coupling system. 3,599,803, Cl. 213-76.
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Corbett, Robert B., to Corbett Associates, Inc. Thermal testing apparatus. 3,599,476, Cl. 73-15.6
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Corpew, Charles R.; and Gleichauf, Paul H., to Stromberg Datagraphix, Inc. Cathode ray tube projection display system. 3,600,628, Cl. 315-27.
Cortigene, Louis R.; and Sherman, William R., to Scott Paper Company. Polyethyleneimine cured epoxy-modified paper. 3,600,272, Cl. 162-164.
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Rowe, Richard Duwayne, 3,600,451.
Costello, Bernard J., to Argus Engineering Co., Inc. Method and apparatus for heating a plurality of closely spaced discrete zones by a single energy source. 3,600,553, Cl. 219-348.
Cotton, Curran D., to Maytag Company, The. Dryer control. 3,599,342, Cl. 34-45.
Couche, Raymond Arthur. Wool scouring process. 3,600,124, Cl. 8-139.1
Coudriet, Edward A.; Dodd, Roy G.; and Kesler, George W., to Inta-Roto, Incorporated. Method of and means for severing web strip material upon completion of winding a roll and initiating winding of a new roll. 3,599,888, Cl. 242-64.
Coverstone, Stephen L.; and Hughes, Raymond K., to Hoerner Waldorf Corporation. Method of making a sewn closure square bottom bag. 3,599,539, Cl. 93-35.
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Cox, Frank T., Jr.; and Svenson, Robert R., to North American Rockwell Corporation. Wedge-actuated three-shoe brake. 3,599,762, Cl. 188-323.
Coykendall, Wayne C. Prefabricated door assembly. 3,599,373, Cl. 49-380.
Coyne, William E.; and Cusic, John W., to Searle, G. D., & Co. 2-Aminoalkyl-3-arylisocarbostyrils. 3,600,394, Cl. 260-288.
CPC International Inc.: *See—*
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Molotsky, Hyman M., 3,600,338.
Craft, John T.; Forbes, John D.; and Vig, Merle E., to Jolyn Corporation. Friction chain drive. 3,599,502, Cl. 74-219.
Craig, Robert S., to General Electric Company. Siloxanes having castor oil derivatives joined thereto through urethane radicals. 3,600,414, Cl. 260-404.5
Craig, Sam N.; Warner, Ellis R., Jr.; and Buckman, Wayne T., to Wascon Systems, Incorporated. Pulping apparatus with solids deflector. 3,599,881, Cl. 241-46.06
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Crain, Millard Jr., to Crain Cutter Company, Inc. Carpet stretcher plate. 3,599,936, Cl. 254-62.
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sembly therefor Ladent image discharge for video camera tube. 3,600,520, Cl. 178-7.85

Creative Polymer Products Corporation: *See—*
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Crescent Niagara Corporation: *See—*
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Crimmins, David J., to Thomas & Betts Corporation. Radially deformable electrical connector including two contiguous members. 3,600,501, Cl. 174-94.

Cripe, Maxwell L., to Bendix Corporation, The. Brake system control means. 3,600,042, Cl. 303-21.

Critten, Donald Louis: *See—*
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Cronin, Dennis C., to Beloit Corporation. Web pickup. 3,600,275, Cl. 162-306.

Crosfield Electronics Limited: *See—*
Dobouney, Mouayed Edouard, 3,600,505.

Crucible Inc.: *See—*
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Crutchley, Michael J.: *See—*
Marsh, David G.; and Crutchley, Michael J.,3,600,378.

Csakvary, Tibor, to Westinghouse Electric Corporation. Low melting point brazing alloy. 3,600,144, Cl. 29-195.

CTS Corporation: *See—*
English, Jack A., 3,600,533.

Cumber, William J., to Erico Products, Inc. Independent support clips. 3,599,921, Cl. 248-317.

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Turner, Charles R., III; Bowers, Raymond G.; Smith, Clyde R.; Behrman, Paul C., Jr.; and Cummings, James A.,3,599,765.

Curtis, Daniel L., to Litton Systems, Inc. Deep submergence heating system. 3,599,625, Cl. 126-204.

Curtis, George N. Gate opener and closer. 3,599,372, Cl. 49-263.

Curtis, Ian F. M., to Solartron Electronic Group Limited, The. Force transducer with elongate vibrating member. 3,600,614, Cl. 310-25.

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Beusman, Curtis C., 3,599,654.

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Cushman, Walton W. Self-modulating gas burner. 3,599,661, Cl. 137-252.

Cushman, Walton W., to Tucker, Martin, as trustee. Adaptive wheeled traction device. 3,600,044, Cl. 305-20.

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Cutillo, Adolfo O.; Gourley, Joe A., Jr.; and Orlando, Ray A., to General Tire & Rubber Company, The. Suspendable mount tube. 3,599,700, Cl. 157-1.21

Cutler-Hammer, Inc.: *See—*
Hedrick, Robert R.; and Wischer, Robert W., 3,599,807.
Hyer, Frank S., 3,599,739.

Cyba, Henryk A., to Universal Oil Products Company. ABS and hydrocarbon polymers stabilized with boron ester-benzotriazole mixtures. 3,600,355, Cl. 260-45.8

Cypher, James H.; and Stilley, George W., to PPG Industries, Inc. Apparatus for tempering glass sheets. 3,600,151, Cl. 65-348.

Cyr, Joseph H.: *See—*
Hurlburt, Joseph C.; McCarty, Horace G.; and Cyr, Joseph H.,3,599,405.

Czernik, Thaddeus W.; Kasabula, Robert E.; and Gagnon, Lionel G., to Dennison Manufacturing Company. Hinged chain drive assembly. 3,600,080, Cl. 355-3.

Daab, Heinz; and Meier, Karl-Heinz, to Quick-Rotan Becker & Notz KG. Shaft speed control system comprising clutch and brake. 3,599,764, Cl. 192-12.

Dachs, Norman W., to Hooker Chemical Corporation. Hydroxyarylthio compounds and process of preparation. 3,600,444, Cl. 260-609.

Daguenet, Henri, to Societe Industrielle des Comprimes. Electrical storage battery. 3,600,232, Cl. 136-134.

Dajlevic, Radovan: *See—*
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Dan River Inc.: *See—*
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Danchuk, Alex, to Bendix Corporation, The. Solid state compact servo system. 3,600,659, Cl. 318-608.

Danfoss A/S: *See—*
Gramkow, Asger, 3,600,656.
Petersen, Tom Kastrup, 3,600,636.
Romer, Bendt Wegge, 3,599,509.
Romer, Bendt Wegge; Meisingset, Lars; Valbjorn, Knud V.; and Knudsen, Jorgen Dahlman, 3,600,110.

Daniel Industries, Inc.: *See—*
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Daniels, Brian K.; Preston, Jack; and Zaukelies, David A., to Monsanto Company. Fiber reinforced matrix composites. 3,600,269, Cl. 161-170.

Danielson, Gideon R. Belt-suspended hammer holder. 3,599,847, Cl. 224-5.

Danjes, Martin: *See—*
Schreiber, August; and Danjes, Martin,3,599,794.

Dann, Albert H.; Davis, Robert L.; and Leman, Eugene R. P., to International Video Corporation. Video tape recorder with editing feature and improved tape speed control. 3,600,508, Cl. 178-6.6

Darcy, Jules; and Palmer, Paul Grenville, to Polymer Corporation Limited. Process of preparing graft interpolymers. 3,600,467, Cl. 260-880.

Darcy, Milton P.; and Tomlinson, Joseph N., to Eastman Kodak Company. Method and apparatus for drying a web. 3,599,341, Cl. 34-23.

Dareing, Donald W., to Cities Service oil Company. Roof bolting and column building for solution mining. 3,600,040, Cl. 299-5.

Dart Industries, Inc.: *See—*
Hartman, Curtis Arnold, 3,599,389.

Dartnell, Robert C., to Bausch & Lomb Incorporated. Lens alignment using gas bearings. 3,599,377, Cl. 51-284.

Dashner, James William, to Kennedy Valve Mfg. Co., Inc. Hydrant drain valve seal. 3,599,662, Cl. 137-307.

Data Printer Corporation: *See—*
Litvin, Melvin L.; and Litvin, Melvin L., 3,599,313.

Datatype Corporation: *See—*
Zappia, Joseph M., 3,600,557.

Davidson, G Dennis: *See—*
Bigelis, Charles F.; Colehour, Jeffrey L.; Davidson, G Dennis; Farquhar, Bannister W.; and Heiberg, Andreas,3,599,429.

Davidson, Kenneth H.; and Morris, Carrol V., to Snorkel Fire Equipment Company. Remotely controllable fire fighting apparatus. 3,599,722, Cl. 169-24.

Davis, John R., Jr.: *See—*
Nathanson, Harvey C.; and Davis, John R., Jr.,3,600,292.

Davis, Mike; and Youmans, Arthur H., to Dresser Industries, Inc. Radioactive tracer well logging. 3,600,582, Cl. 250-83.3

Davis, Neil M.; and Clawson, Arthur R., to United States of America, Navy. Controlled nucleation in zone recrystallized InSb films. 3,600,237, Cl. 148-1.6

Davis, Raymond Leslie; Fish, Daniel Cecil Edward; and Fishlock, Ronald Christoper, to Hovermarine Limited. Gas-cushion vehicles. 3,599,746, Cl. 180-127.

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Dann, Albert H.; Davis, Robert L.; and Leman, Eugene R. P.,3,600,508.

Davis, Robert, to Scientific Industries, Inc. Apparatus for reagent formation. 3,600,135, Cl. 23-253.

Davis, Thomas Wade; and Gilardi, Robert John, to Du Pont de Nemours, E. I., and Company. Process of flash spinning and collecting plexifilament to form rod-shaped back-windable batt. 3,600,483, Cl. 264-53.

Daw, Donald F.: *See—*
Mather, Graeme K.; and Daw, Donald F.,3,599,488.

Dawson, Robert H.: *See—*
Koletsos, Peter K.; and Dawson, Robert H.,3,599,472.

Dawson, Robert J., to ESB Incorporated. Mercury cell. 3,600,231, Cl. 136-111.

Dean, Fred, to Imperial Chemical Industries Limited. Production of 4-methylpentene-1-. 3,600,455, Cl. 260-682.

De Benedictis, Leonard Charles, to Union Carbide Corporation. Diffuse optical pumping system for lasers. 3,600,702, Cl. 331-94.5

de Boer, Henry, to Jacobs, F. L., Co. Ash receptacle for automobiles. 3,600,051, Cl. 312-246.

Decatur Pump Company: *See—*
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de Coene, Frans J.; and Dewaele, Daniel C. C., to Rand, Sperry, Corporation. Adjustable mounting for a reel on a header. 3,599,410, Cl. 56-221.

Deere & Company: *See—*
Bichel, Darwin; and Malcolm, Robert L., 3,599,644.
Bichel, Darwin Carl, 3,599,407.
Heising, Robert Albert; and Manns, William Frederick, 3,599,402.
McMullen, Larry Gene, 3,600,015.
Roll, John MacDougal; and MacGregor, William Roderick, 3,599,801.

De Forest, Raymond Abbott; and Moore, Robert Linus, to Secon Metals Corporation. Method of using and for fabricating ultrasonic bonding grade aluminum wire and resulting product. 3,600,239, Cl. 148-11.5

De Frank, Philip J.: *See—*
Yurkoski, Frank R.; and De Frank, Philip J.,3,599,575.

DeGuire, Rejean: *See—*
Berman, Icchok Majer; Brunozzi, Lorenzo; and DeGuire, Rejean,3,599,583.

DeJonckheere, Raphael G. G.: *See—*
Giesler, Philippe L. A.; Desurmont, Robert F. M. J.; and DeJonckheere, Raphael G. G.,3,599,450.

Del-Guy Inc.: *See—*
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Delarue, Roger: *See—*
Carpentier, Serge; Dajlevic, Radovan; Delarue, Roger; Francois, Henri; Portal, Guy; Pradel, Jacques; and Soudain, Georges,3,600,579.

Delbouille, Andre; and Derroitte, Jean-Louis, to Solvay & Cie. Process and catalysts which are supported on partially unsaturated macromolecular compounds for the polymerization and copolymerization of - olefins and the resultant polymers and copolymers. 3,600,367, Cl. 260-80.78

Delmag-Maschinenfabrik Reinhold Dornfeld: *See—*
Kehrberger, Achim, 3,599,445.

Del Vecchio, George D., to Xerox Corporation. Optical assembly with supplemental lens means. 3,600,066, Cl. 350-183.

Del Vecchio, George D.; and Warren, Larry H., to Xerox Corporation. Sheet handling apparatus. 3,599,966, Cl. 271-9.

del Vesco, Adriano: *See—*
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Demag Aktiengesellschaft: *See—*
Grimpe, Karl, 3,599,481.

DeMartini, Mario. Centrifuge for separation of mixtures of solids and liquids of different weight. 3,599,861, Cl. 233-2.

Demers, James P.; and Kling, Igor, to Demming, Inc. Pivot assembly in a non-piercing hoop earring. 3,599,444, Cl. 63-14.

Demming, Inc.: *See—*
Demers, James P.; and Kling, Igor, 3,599,444.

Dempsey, James R.: *See—*
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Denki Kagaku Kogyo Kabushiki Kaisha: *See—*
Moriguchi, Eichi; Goto, Takeshi; Hiraoka, Michikazu; Mitsumori, Teruhisa; and Rokudo, Shonosuke, 3,600,466.

Dennison Manufacturing Company: *See—*
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Depoorter, Henri: *See—*
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D'Ercoli, Giacinto C.; and Mlachnik, Albert A., to EZ Painter Corporation. Paint applying instrument with release latch. 3,599,265, Cl. 15-21.

Derenthal, Jerome W., to Stapling Machines Co. Apparatus for applying adhesive tape around packages. 3,600,253, Cl. 156-468.

De Rosset, Armand J.: *See—*
Reichenbacher, Paul H.; and De Rosset, Armand J.,3,600,453.

Derroitte, Jean-Louis: *See—*
Delbouille, Andre; and Derroitte, Jean-Louis,3,600,367.

Dersch, Fritz: *See—*
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Design Products Corporation: *See—*
Clor, Anthony G., Jr., 3,600,606.

Desurmont, Robert F. M. J.: *See—*
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Deutsche Gold- und Silber Scheideanstalt vormals Roessler: *See—*
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De Vries, Adrian J.: *See—*
Adler, Robert; and De Vries, Adrian J.,3,600,710.

De Vries, Paul F.; and Scarborough, James M., to United States of America, Atomic Energy Commission. Sodium purification process. 3,600,155, Cl. 75-66.

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de Coene, Frans J.; and Dewaele, Daniel C. C.,3,599,410.

Diassi, Patrick A.; and Principe, Pacifico A.Process for preparing acetals and ketals of 2$\beta$, 16$\alpha$, 17$\alpha$-trihydroxy steroids. 3,600,280, Cl. 195-51.

Dickson, Benjamin H. Straw and chaff saver or buncher. 3,599,844, Cl. 222-508.

Diddams, Donald Guy: *See—*
Gitchel, Wayne Benjamin; Diddams, Donald Guy; and Hoffman, Clarence Anthony,3,600,442.

Diebold, Incorporated: *See—*
Bohland, Robert J., 3,600,312.

Dilley, Donald R., to Boeing Company, The. Frame stringer tie. 3,600,016, Cl. 287-189.35

Dillon-Corneck, Jacques C.: *See—*
Eyres, Alan R.; and Dillon-Corneck, Jacques C.,3,600,310.

Dinges, Karl: *See—*
Kanpp, Karl-Heinrich; Ott, Karl-Heinz; Dinges, Karl; and Scholtan, Werner,3,600,465.

Di Nicolantonio, Frank; Drankhan, Voit C.; and Wagener, Paul W., to Westinghouse Electric Corporation. Computer system for determining the stop length required to arrest a moving strip of material. 3,600,562, Cl. 235-151.32

Diolot, Lucien, to Societe Nouvelle Spidem. Method of and apparatus for bending the backing-up of four-high rolling mills and the work rolls of two-high rolling mills. 3,599,466, Cl. 72-245.

DiPalma, Joseph. Cable grip. 3,599,913, Cl. 248-60.

Di Pasquale, Renato: *See—*
Stachurski, Zbigniew; and Di Pasquale, Renato,3,600,230.

Di Renzo, Simon, to Philco-Ford Corporation. Method of forming electrical connections with solder resistant surfaces. 3,599,326, Cl. 29-626.

Dirlik, Paul P. Control assembly for controllable pitch propeller. 3,600,102, Cl. 416-157.

Disposables, Inc.: *See—*
Frank, Daniel H., 3,600,262.

Ditscheid, Hans Leo; and Scherrer, Walter, to Felten & Gilleaume Carlswerk Aktiengesellschaft. Terminal assembly for the end portion of a fluid- cooled coaxial cable. 3,600,709, Cl. 333-33.

Ditty, James E.: *See—*
Meyers, Dale J.; and Ditty, James E.,3,599,282.

Diuzet, Emile Jean, to Societe Industrielle Des Nouvelles Techniques Radioelectriques et de L'Electronique Francaise (Sintra). Image and sound tracks supports, recording apparatus and apparatus for reading said tracks. 3,599,549, Cl. 95-12.

Dobouney, Mouayed Edouard, to Crosfield Electronics Limited. Color correction apparatus for a color printer. 3,600,505, Cl. 178-5.2

Dodd, Roy G.: *See—*
Coudriet, Edward A.; Dodd, Roy G.; and Kesler, George W.,3,599,888.

Dodgen Industries, Inc.: *See—*
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Dodgen, John N.; and Swigger, Paul C., to Dodgen Industries, Inc. Livestock feed processing apparatus. 3,599,688, Cl. 146-124.

Doering, John P., Jr., to Beckman Instruments, Inc. Rotor assembly. 3,600,013, Cl. 287-52.08

Dombro, Robert A., to Universal Oil Products Company. Preparation of primary alcohols. 3,600,449, Cl. 260-638.

Donohue, Paul Christopher, to Du Pont de Nemours, E. I., and Company. Cobalt chromium sulfide magnetic compositions having a pyrite type structure and devices containing same. 3,600,313, Cl. 252-62.51

Donovan, Batt. Apparatus for dehorning animals such as cattle. 3,599,329, Cl. 30-228.

Donovan, Marion. Actuator for slide fastener. 3,599,274, Cl. 16-110.

Doo, Ven Y.; and Spiro, Andrea, to International Business Machines Corporation. Method of fabricating semiconductor devices by diffusion. 3,600,241, Cl. 148-175.

Dorner John R.: *See—*
Butts, Orville R.; Dorner John R.; and Hanisco, Raymond L.,3,599,358.

Doughty, Charles E.: *See—*
Gray, David F.; Doughty, Charles E.; and Pinney, Frank B.,3,600,103.

Dow Chemical Company, The: *See—*
Bohme, Reinhard D., 3,600,468.
Glaza, Gordon K., 3,600,005.
Harmon, Thomas O., 3,600,462.
Kuhn, Stephen J.; and Ilavsky, Janet E., 3,600,436.
McFedries, Robert, Jr.; and Seidler, Don W., 3,600,267.
Peoples, Lawrence, 3,599,940.
Wang, Chun-Shan; and Hennis, Henry E., 3,600,375.

Downey, Rogers B., to Polaroid Corporation. Cassette motion picture system with unique gear engagement arrangement. 3,600,070, Cl. 352-72.

Downey, Rogers B., to Polaroid Corporation. Compact motion picture film handling cassette and camera. 3,600,071, Cl. 352-78.

Downs, George F., III; Ver Nooy, Burton; and Gwartney, William R., Jr., to Williamson, T. D., Inc. Pipe coupling. 3,600,010, Cl. 285-96.

Doyle, William C., to Itek Corporation, mesne. Apparatus and method for interferring with radio communications. 3,600,685, Cl. 325-332.

Drankhan, Voit C.: *See—*
Di Nicolantonio, Frank; Drankhan, Voit C.; and Wagener, Paul W.,3,600,562.

Drechsel, Erhart K.; and Sardisco, John B., to Pennzoil United Inc. Phosphate fertilizer products. 3,600,152, Cl. 71-34.

Dreessen, Gerardus I. J., to Stamicarbon N. V. Preparation of hydroxycapronitrile. 3,600,423, Cl. 260-465.2

Dresser Industries, Inc.: *See—*
Berry, Robert F., 3,600,105.
Cope, Geoffrey Wilton, 3,599,803.
Davis, Mike; and Youmans, Arthur H., 3,600,582.
Magill, Charles W., 3,599,712.

Drexel University: *See—*
Labes, Mortimer M., 3,600,212.

Druey, Jaen; and Schmidt, Paul, to Ciba Corporation. N-substituted pyrazolo-pyrimidines. 3,600,389, Cl. 260-256.4

Dubler, Dorothea L., 50% to Sond, Josephine A. L. Portable dual easel. 3,599,925, Cl. 248-452.

Dubouch, Claude; and Petit, Maurice, to Commissariat a l'Energie Atomique. Apparatus for the study of thermal cycling of element particulary nuclear reactor fuel elements. 3,599,475, Cl. 73-15.

Dudek, Edmond C., to Singer Company, The. Integral bit sharpener for power tools. 3,599,302, Cl. 29-26.

Duhault, Jacques: *See—*
Regnier, Gilbert; Canevari, Roger; and Duhault, Jacques,3,600,395.

Du Jack, George M., to General Electric Company. Silicone construction sealant. 3,600,352, Cl. 260-37.

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Beall, George H.; and Duke, David A.,3,600,204.

Duncan, David M., to Fairchild Camera and Instrument Corporation. Bipolar and field-effect transistor using polycrystalline epitaxial deposited silicon. 3,600,651, Cl. 317-235.

Du Pont de Nemours, E. I., and Company: *See—*
Billingsley, John G. S.; and Nickles, David E., 3,600,490.
Davis, Thomas Wade; and Gilardi, Robert John, 3,600,483.
Donohue, Paul Christopher, 3,600,313.
Franklin, Richard C., 3,600,376.
Heacock, James Flaviel; and Sweeney, Arthur Walter, 3,600,361.
Janowski, Alexander M., 3,599,880.
Kwolek, Stephanie Louis, 3,600,350.
Levitt, George, 3,600,386.
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Durckheimer, Walter; and Schrinner, Elmar, to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning. Quinoxaline-1,4-dioxides. 3,600,388, Cl. 260-250.
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Fussell, Theodore J., to American Standard Inc. Automatic refill device having fluidically operated control. 3,599,655, Cl. 137-81.5
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Garcia, Armando J., to Mattel, Inc. Dancing doll with means interfering with forward movement thereof. 3,599,364, Cl. 46-136.
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Gego, Arnold; and Gugenhan, Heinrich. Row type agricultural apparatus for thinning, hoeing or spraying of plants. 3,599,725, Cl. 172-6.
Gehring, Emil. Rotatable barbecue grill. 3,599,624, Cl. 126-25.
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Gessinger, Herald, to International Standard Electric Corporation. Electromagnetic pulse counter. 3,600,641, Cl. 317-157.

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Giuliani, John F.: *See—*
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Glass, Marvin I.; and Meyer, Burton C., to Glass, Marvin, and Associates. Rotary block tic-tac-toe board and projectiles. 3,599,977, Cl. 273-95.

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Godar, Joseph Lambert, Jr., to American Can Company. Hot melt adhesive for polyethylene. 3,600,347, Cl. 260-27.

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Gold, Elijah H. Certain 1-aralkyl-3-azetidinol compounds. 3,600,380, Cl. 260-239.

Goldberg, Allan R. Cooking accessory. 3,599,558, Cl. 99-339.

Goldberg, Leon J., to General Electric Company. Time ratio solid state voltage regulator. 3,600,668, Cl. 323-43.5

Goldberg, Leon J.; and Martzloff, Francois D., to General Electric Company. Overcurrent protection for solid state voltage regulator. 3,600,664, Cl. 323-9.

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Grabovac, Bosko. Cam means for torque wrenches. 3,599,515, Cl. 81-52.5

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Graham, Stanley T.; and Rintoul, Gordon Robert, to Ace Explosives Ltd. Drive point for explosive charge. 3,599,567, Cl. 102-21.8

Gramkow, Asger, to Danfoss A/S. Starting means for a single-phase asynchronous motor. 3,600,656, Cl. 318-221.

Grandmont, Paul E. Singer-General Precision, Inc. Complementary paired transistor circuit arrangements. 3,600,696, Cl. 330-13.

Grange, Jean Claude; and Hernandez, Philippe Henri, to International Business Machines Corporation. Relay driver with automatic time distortion compensation. 3,600,639, Cl. 317-148.5

Grant, Charles James; Cheney, Paul E.; and Belsito, Kenneth J. Apparatus for slicing comestible slabs. 3,599,689, Cl. 146-158.

Grant, Norman H.; and Alburn, Harvey E., to American Home Products Corporation. 1-Aminocyclopentanecarboxylic acid esters. 3,600,426, Cl. 260-468.

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Green, Frank B. K. Diffusion pulp washer. 3,599,448, Cl. 68-181.

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Grenier, Robert P., to Western Electric Company, Incorporated. Method and system for adjusting electrical components using alternately applied signals. 3,600,675, Cl. 324-57.

Gresham, Conrad W. Self service multi-storied rotatable airplane hangar and operating means therefor. 3,599,809, Cl. 214-16.1

Greulich, Robert G., to Singer Company, The. Sewing machine pneumatic needle threader. 3,599,587, Cl. 112-225.

Grimm, Robert A., to Ashland Oil & Refining Company. N-alkylation of aromatic amines. 3,600,413, Cl. 260-404.

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Gutman, Georges M.; and Beaussant, Raymond H., to Intertechnique. Automatic head harness for rapidly fitting, carrying and rapidly removing devices of different types. 3,599,636, Cl. 128-146.7

Gwartney, William R., Jr.: *See—*
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Hagemann, Hermann, to Farbenfabriken Bayer Aktiengesellschaft. Process for the preparation of a mixture of N- chlorocarbonyl-isocyanide dichloride and carbonyl-bis-(N-- isocyanide dichloride) and the corresponding thio compounds. 3,600,439, Cl. 260-544.

Hagemeyer, Hugh J., Jr.; Hull, David C.; and Park, Samuel J., to Eastman Kodak Company. Process for producing substantially ash-free polyolefin polymers. 3,600,463, Cl. 260-878.

Hager, Robert R., to Bendix Corporation, The. Simplified adjusting means for wedge brakes. 3,599,759, Cl. 188-79.5

Haines, Robert S., to International Business Machines Corporation. Magnetic compositions of chromium oxide and methods of manufacture. 3,600,314, Cl. 252-62.51

Haines, Robert S., to International Business Machines Corporation. Method of manufacturing magnetic compositions of carbon modified chromium oxide. 3,600,315, Cl. 252-62.51

Haist, Grant M.; and Pupo, David A., to Eastman Kodak Company. Photographic elements, compositions and processes. 3,600,176, Cl. 96-66.

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Halsall, James Richard, to Imperial Chemical Industries Limited. Binary pulse rate multipliers. 3,600,686, Cl. 328-38.

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Anders, Gerhard; and Jung, Werner, 3,599,938.

Hamilton, William F., to Mallay, Myron F., d/b/a Mallay Tool Service. Pelletizing die plate. 3,599,285, Cl. 18-12.

Hammes, Paul A.: *See—*
Spangler, Herbert D.; Hammes, Paul A.; and Everson, Charles W.,3,600,197.

Handler, Eugene H. High performance seaplane or amphibian. 3,599,903, Cl. 244-13.

Hanisco, Raymond L.: *See—*
Butts, Orville R.; Dorner John R.; and Hanisco, Raymond L.,3,599,358.

Hanley Development Corporation: *See—*
Traphagen, Peter A.; and Dyczynski, Karol T., 3,599,522.

Hansen, David E.; and Crapsey, Arthur H., to Eastman Kodak Company. Slidable cover and handle member for photographic cameras. 3,599,553, Cl. 95-86.

Hansen, Glen D.: *See—*
Buschbom, Floyd E.; and Hansen, Glen D.,3,599,878.

Hansen, Palle G.; and Batzler, William E., to United States of America, Navy. Spherical reflector. 3,599,747, Cl. 181-0.5

Hansen, William A. Volumetric meter. 3,599,839, Cl. 222-146.

Hanson, Charles C., to International Business Machines Corporation. Logarithmic sense amplifier having means for establishing a predetermined output voltage level when the input signal is at a maximum. 3,600,589, Cl. 250-214.

Hanson, Herbert G., to GPE Controls, Inc. Internal safety shutoff and operating valve. 3,599,931, Cl. 251-144.

Hanson, Robert S., to General Motors Corporation. Unitary fan evaporator assembly. 3,599,442, Cl. 62-419.

Hara, Okitada: *See—*
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Harcourt, Brace & World: *See—*
Goodman, Jack L.; Brown, Lynne P.; and Podesta, Dorothy A., 3,600,087.

Harder, Arthur J., Jr., to Coach and Car Equipment Corporation. Fluid cushioning assembly. 3,599,956, Cl. 267-120.

Hardman, Carl C., to Westinghouse Electric Corporation. Method of impregnating flexible metallic battery plaques. 3,600,227, Cl. 136-76.

Harmon, Thomas O., to Dow Chemical Company, The. Olefin polymer blend with dicarboxylic acid of block copolymer of $\alpha$-methyl styrene and aliphatic conjugated diolefin. 3,600,462, Cl. 260-876.

Harmond, Jesse E.; and Smith, Jack O. Concentrated golf game. 3,599,980, Cl. 273-176.

Harris, Thomas, to Glastic Corporation, The. Mechanical end fittings for tension rods. 3,600,014, Cl. 287-83.

Harris-Intertype Corporation: *See—*
Goettsch, Walter J., 3,599,518.

Harrison, George; and Harrison, Nelson K., to North American Rockwell Corporation, mesne. Method for making forgings. 3,599,314, Cl. 29-418.

Harrison, Nelson K.: *See—*
Harrison, George; and Harrison, Nelson K.,3,599,314.

Hartman, Curtis Arnold, to Dart Industries, Inc. Tube filling machine with tube positioning mechanism. 3,599,389, Cl. 53-51.

Hartz, John J., to Goodyear Tire & Rubber Company, The. Pneumatic tire. 3,599,696, Cl. 152-361.

Harvey, Donald M., to Eastman Kodak Company. Exposure control with low light signal. 3,599,546, Cl. 95-10.

Harvey, Donald M., to Eastman Kodak Company. Automatic focusing device. 3,599,552, Cl. 95-44.

Harvey, Douglas J., to General Motors Corporation. Heat treatable creep resistant solder. 3,600,164, Cl. 75-166.

Harvey, Frank E.: *See—*
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Harvill, Henry L.; and Harvill, John I. Method of agitating molten metal in a metal dispensing furnace. 3,599,831, Cl. 222-1.

Harvill, John I.: *See—*
Harvill, Henry L.; and Harvill, John I.,3,599,831.

Hasstedt, Kenneth L.: *See—*
Hasstedt, Roger D.; and Hasstedt, Kenneth L.,3,599,812.

Hasstedt, Roger D.; and Hasstedt, Kenneth L. Crane and tow unit. 3,599,812, Cl. 214-86.

Hattori, Setsuko: *See—*
Tosaka, Umi; Sano, Yozo; Matsuo, Takehiko; Negishi, Hirokazu; Ikuta, Tamao; Yamaguchi, Masaru; and Hattori, Setsuko,3,600,256.

Haubein, Albert H., to Hercules Incorporated. N-$\alpha$-dialkoxyphosphinothioacetyl-N-methylcarbamates of phenols. 3,600,471, Cl. 260-938.

Haueter, Jean, to Vinetal S.A. Mainspring slipping ring for a self-winding time- piece. 3,599,422, Cl. 58-86.

Hawker Siddeldy Aviation Limited: *See—*
Szlenkier, Tadeusz Karol, 3,599,900.

Hawkins, Paul Maddison, to Minnesota Mining and Manufacturing Company. Lock structure. 3,600,021, Cl. 292-167.

Haws Drinking Faucet Company: *See—*
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Hayakawa, Kuramatsu: *See—*
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Hayes, C. I., Inc.: *See—*
Westeren, Herbert W.; Kimball, William H.; Scotto, Vincent; and Vanderford, Wallace S., Jr., 3,599,946.

Hayward, David W. Animal scratching device. 3,599,606, Cl. 119-1.

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Heacock, James Flaviel; and Sweeney, Arthur Walter, to Du Pont de Nemours, E. I., and Company. Process for drying polyamide-acid/imide film. 3,600,361, Cl. 260-78.

Heartness, Olaf. Spear having frangible nose with explosive device to be detonated on impact. 3,599,569, Cl. 102-48.

Heckert, David C., to Procter & Gamble Company, The. Bleaching of polymaleate homopolymers and copolymers. 3,600,366, Cl. 260-78.4

Hedlund, Harland R.; Wethe, Harry K.; and Turner, Vernon L., to Buckbee-Mears Company. Hydrodynamic turnover mechanisms. 3,599,851, Cl. 226-97.

Hedrick, Robert H., to Struthers Scientific and International Corporation. Crystallization apparatus. 3,600,139, Cl. 23-273.

Hedrick, Robert H., to Struthers Scientific and International Corporation. Flow crystallizer. 3,600,140, Cl. 23-273.

Hedrick, Robert R.; and Wischer, Robert W., to Cutler-Hammer, Inc. Article counter-stacker having mechanically operated gates on the stack receiving table. 3,599,807, Cl. 214-6.5

Hedwin Corporation: *See—*
Speas, Charles A., 3,599,840.

Heflinger, Lee O., to TRW Inc. Holograms having increased phase sensitivity. 3,600,097, Cl. 356-106.

Heflinger, Lee O.; and Brooks, Robert E., to TRW Inc. Holographic interferograms with increased light intensity. 3,600,096, Cl. 350-106.

Hegi, Robert. Pourer tube for fluid containers. 3,599,836, Cl. 222-90.

Heiberg, Andreas: *See—*
Bigelis, Charles F.; Colehour, Jeffrey L.; Davidson, G Dennis; Farquhar, Bannister W.; and Heiberg, Andreas,3,599,429.

Heidenreich & Harbeck: *See—*
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Heilmeier, George Harry; and Zanoni, Louis A., to RCA Corporation. Electro-optic device having grooves in the support plates to confine a liquid crystal by means of surface tension. 3,600,061, Cl. 350-160.

Heine, Christian; and von Schilcher, Clemens, to Henkel & Cie G.m.b.H. Novel cream products and their preparation. 3,600,196, Cl. 99-134.

Heine, Helmut A., to Optotechnik G.m.b.H., and Propper Manufacturing Company, Inc. Hand-held ophthalmoscopes. 3,600,067, Cl. 351-12.

Heins, Roger A.: *See—*
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Heintzelman, William J.: *See—*
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Heising, Robert Albert; and Manns, William Frederick, to Deere & Company. Corn head mounting structure. 3,599,402, Cl. 56-2.

Heitmann, William E.: *See—*
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Hellund, Emil J. Asepsis process and apparatus. 3,600,126, Cl. 21-54.

Helm, Herbert M.: *See—*
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Helming, Bernd, to Polysius AG. Method and apparatus for heat treatment of materials. 3,599,945, Cl. 263-36.

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Hemmat, Naim: *See—*
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Henc, Edward V. Box stitching apparatus. 3,599,855, Cl. 227-7.

Henkel & Cie G.m.b.H.: *See—*
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Schmadel, Edmund; and Berg, Markus, 3,600,320.

Henley, Virgil Estill; and Robertson, Martin Nesbitt, to General Tire & Rubber Company, The. Multiple-station servicing assembly for tire building operations. 3,600,252, Cl. 156-406.

Henman, Leslie Arthur: *See—*
Gurner, John Raymond; and Henman, Leslie Arthur,3,599,670.

Hennig, Fridolin, to Agfa-Gevaert Aktiengesellschaft. Release means for photographic apparatus. 3,599,548, Cl. 95-11.

Henning, Elmer J.: *See—*
Seamands, Robert E.; and Henning, Elmer J.,3,599,530.

Henning, Wilhelm. Device for inserting and removing contact lenses. 3,600,028, Cl. 294-1.

Hennis, Henry E.: *See—*
Wang, Chun-Shan; and Hennis, Henry E.,3,600,375.

Henry, John P.Orthopedic's cast chair. 3,599,962, Cl. 269-322.

Hercules Incorporated: *See—*
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Hernandez, Philippe Henri: *See—*
Grange, Jean Claude; and Hernandez, Philippe Henri,3,600,639.

Herr, Paul A. Humidifier. 3,599,942, Cl. 261-92.

Herrli, Hans; and Herrli, Peter. Rack for phonograph albums. 3,599,799, Cl. 211-40.

Herrli, Peter: *See—*
Herrli, Hans; and Herrli, Peter,3,599,799.

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Heth, Sherman C.: *See—*
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Hetzel, Max, to Centre Electronique Horloger S.A. Pawl arrangement. 3,599,501, Cl. 74-142.

Heugebaert, Frans Clement: *See—*
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Hewlett-Packard Company: *See—*
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Hexcel Corporation: *See—*
Jackson, Wendell T.; Stark, John A.; and Garrett, Beverley R., 3,600,249.

Hi-Speed Checkweigher Co., Inc.: *See—*
Pettis, Charles R., Jr., 3,599,656.

Hibbs, David Arthur, to International Standard Electric Corporation. Joint between a submarine coaxial electrical cable and a repeater tail cable and method of making same. 3,600,499, Cl. 174-70.

Hibbs, Louis E., Jr., to General Electric Company. Zinc diffused copper. 3,600,221, Cl. 117-217.

Higuchi, Tomitake: *See—*
Ono, Terumichi; Haga, Tsuneo; Takagi, Yasuo; and Higuchi, Tomitake,3,600,271.

Hildebrandt, Willi; and Van Huet, Aloysius Theodorous. Tractor-trailer rig. 3,600,304, Cl. 280-426.

Hill, Homer G., to Owens-Corning Fiberglass Corporation. Heat cleanable coating for glass fibers. 3,599,418, Cl. 57-164.

Hill, John A.; and Bauer, Charles A., to Sargent and Company. Key reader and identifier system. 3,599,454, Cl. 70-265.

Hill, William Frank, to Lucas, Joseph, (Industries) Limited. Maximum acceleration or deceleration meter for a road vehicle. 3,600,679, Cl. 324-162.

Hinds, Schubert W. Pressure sensitive adhesive tape applicator. 3,600,255, Cl. 156-527.

Hinterstocker, Adolf. Coin testing device for comparing coin to be tested with a standard coin. 3,599,771, Cl. 194-100.

Hirano, Shuichi; and Noda, Seiichi. Suction conveyer. 3,600,041, Cl. 302-23.

Hiraoka, Michikazu: *See—*
Moriguchi, Eichi; Goto, Takeshi; Hiraoka, Michikazu; Mitsumori, Teruhisa; and Rokudo, Shonosuke,3,600,466.

Hirosawa, Frank N., to Furane Plastics Incorporated. Epoxy resin cured with liquid resinous amine curing agents. 3,600,362, Cl. 260-39.

Hirsbrunner, Hans G., to Texas Instruments, Incorporated. Furnace fuel valve energizing circuit. 3,600,117, Cl. 431-66.

Hirsbrunner, Hans G., to Texas Instruments, Incorporated. Furnace control apparatus. 3,600,118, Cl. 431-66.

Hitachi Shipbuilding and Engineering Co., Ltd.: *See—*
Niwa, Toshio; Kimoto, Yasuo; Tamiya, Katsunori; and Okamura, Hisashi, 3,600,546.

Hitzeroth, Franklin C., to McGraw-Edison Company. Toaster timer having external adjustment. 3,599,312, Cl. 29-329.

Hoadley, Claude R., to Feedmatic-Detroit, Inc. Feed wheel for feeding intermittently movable parts. 3,599,781, Cl. 198-212.

Hobbs, James W.: *See—*
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Smith, Charles Phillip; Glaze, Stanley George; and Wynne, John Roger, 3,599,537.

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Scott, John W., Sr.; and Hockenson, John A.,3,599,510.

Hoegerl, Otto, to National Tel-Tronics Corporation. Electric terminal board mounting structure. 3,599,920, Cl. 248-300.

Hoegerl, Otto, to National Tel-Tronics Corporation. Self-shorting phono plug. 3,600,531, Cl. 200-51.1

Hoerner Waldorf Corporation: *See—*
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Hoffman, Clarence Anthony: *See—*
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Hoffmann-La Roche Inc.: *See—*
Oertel, George W.; and Munzel, Kurt, 3,600,495.
Surmatis, Joseph Donald, 3,600,473.

Hofmann, Harry O.: *See—*
Giolito, Silvio; and Hofmann, Harry O.,3,600,136.

Hogan, William John; and Liantonio, Vito Michael, to Fairchild Hiller Corporation. Apparatus for controlling temperature relative to humidity. 3,599,862, Cl. 236-44.

Holdampf, Carl J.; and Murphy, Randal T., to Lear Siegler, Inc. Fold up seat. 3,600,033, Cl. 297-16.

Holland, Dewey G.; Moyer, Ronald C.; Polevy, John H.; and Walde, Robert A., to Air Products and Chemicals Inc. Perfluoro cyclohexane esters of acrylic and methacrylic acids. 3,600,433, Cl. 260-486.

Holley, William G., Sr.; and Lester, John E. Bracket for assembling concrete forms. 3,599,929, Cl. 249-213.

Holmes, Horace D., to Masco Corporation. Lock nut assembly and method of making the same. 3,599,692, Cl. 151-2.

Holt, Donald G. Tool holder for a machine tool. 3,599,996, Cl. 279-1.

Holtz, Hans D., to Phillips Petroleum Company. Reaction of 1,2-bis(3-cyclohexen-1-yl) ethylenes with certain unsaturated compounds and product obtained thereby. 3,600,384, Cl. 260-240.

Hom, Felix; and Potter, Earl B., to Rohr Corporation. Thrust reversing apparatus. 3,599,874, Cl. 239-265.29

Honda Giken Kogyo Kabushiki Kaisha: *See—*
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Honda, Zenko: *See—*
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Honeywell Inc.: *See—*
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Reed, Wayne D., 3,599,934.
Thompson, Maynard L., 3,599,841.

Hong, Charles C., to Esso Research and Engineering Company. Lube extraction with mixed solvents. 3,600,302, Cl. 208-323.

Hooker Chemical Corporation: *See—*
Baranauckas, Charles F.; and Gordon, Irving, 3,600,339.
Dachs, Norman W., 3,600,444.

Hoover Ball and Bearing Company: *See—*
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Hori, Yutaka; Honda, Zenko; and Nomura, Yoichi, to Nitto Electric Industrial Co., Ltd. Surface protecting sheet. 3,600,268, Cl. 161-167.

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Fenster, Paul; Horrigan, John B.; and Safran, Leonard,3,600,629.

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Horton, Robert: *See—*
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Hotchkiss, Kenneth W.; Schrunk, John F.; and Thom, Le Roy, to T-L Irrigation Company. Self-propelled irrigating apparatus. 3,599,664, Cl. 137-344.

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Howells, William H., to Midland-Ross Corporation. Keeper key. 3,599,527, Cl. 85-8.3

Hu, Shih-En, to Esso Research and Engineering Company. Lubricating oil compositions having improved sludge dispersancy. 3,600,327, Cl. 252-32.7

Huber, William B., to Motorola, Inc. Cartridge locking and ejector mechanism. 3,599,985, Cl. 274-4.

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Hudon, Frederick A., Jr.: *See—*
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Hughes Aircraft Company: *See—*
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Hughes, Benjamin F. Gravity safety switch. 3,599,745, Cl. 180-104.

Hughes, Norman J., to TRW Inc., mesne. Flanged nut with attaching prongs. 3,599,691, Cl. 151-41.73

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Humphrey, Earl L., to Gulf Research & Development Company. Coating composition for wooden concrete forms and method of preparing wooden forms having improved concrete anti-sticking characteristics. 3,600,348, Cl. 260-28.5
Humphrey, Paul G.; and Bunting, Charles W., to McCall Printing Company, The. Control apparatus for book hopper. 3,599,965, Cl. 271-3.
Hunnicutt, Wayne E.; and Rossbach, Peter G., to Applied Power Industries, Inc. Load supporting stand. 3,599,923, Cl. 248-352.
Hunt, Jerry Donald; and Spitz, Robert Paul, to Firestone Tire & Rubber Company, The. Interconnected rubbers stabilized with borates. 3,600,351, Cl. 260-33.6
Hunter, Philip John, to British Petroleum Company Limited, The. Platinum loaded zeolite. 3,600,332, Cl. 252-455.
Hunter, Wood E.: *See—*
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Hurlburt, Joseph C.; McCarty, Horace G.; and Cyr, Joseph H., to Sperry Rand Corporation. Header suspension. 3,599,405, Cl. 56-14.4
Hutchens, Ralph W., Sr. Apparatus for fabricating multiple type truss members. 3,599,562, Cl. 100-100.
Hutcheon, Ian Carrodus; Foster, Stephen Arthur; Barton, Kenneth; and Critten, Donald Louis, to Kent, George, Limited. Electric controller with improved stabilizer apparatus for the storage capacitor. 3,600,689, Cl. 328-127.
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Hyduk, Stanley J.; and Zeleney, Leo Z., to General Motors Corporation. Monitoring device for counting parts passing through an electrolytic bath. 3,600,293, Cl. 204-194.
Hyer, Frank S., to Cutler-Hammer, Inc. Overload protection for strain gauge load cells used in weigh scale load measurement. 3,599,739, Cl. 177-211.
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Ingersoll, William C.; and Shepherd, Jack W., to Thiokol Chemical Corporation. Ammunition anti-defuzing device. 3,599,570, Cl. 102-57.
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Slagley, William E.; and Maloney, Lawrence G., 3,599,952.
Inoue, Kazuo, to Nippon Piston Ring Co., Ltd. Piston and rider ring combination for horizontal reciprocating compressors. 3,600,045, Cl. 308-4.
Inouye, Katsuya; Okada, Hideya; Hosoi, Yuzo; and Yukawa, Kenichi, to Nippon Steel Corporation. Low-alloyed high strength steel having resistance to the sulfide corrosion cracking. 3,600,161, Cl. 75-126.
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Coudriet, Edward A.; Dodd, Roy G.; and Kesler, George W., 3,599,888.
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International Recreation Products, Inc.: *See—*
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Jackson, Wendell T.; Stark, John A.; and Garrett, Beverley R., to Hexcel Corporation. Reinforced plastic honeycomb method and apparatus. 3,600,249, Cl. 156-197.
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Jaeggli, Rudolf, to Reiter Machine Works Ltd. Spindle stopping method and apparatus for implementing same. 3,599,415, Cl. 57-88.
James, Robert C., to Packaging Frontiers, Inc. Form-fill-seal packaging apparatus and methods. 3,599,387, Cl. 53-28.
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Janecka, Gustav, to Neptune Meter Company. Tape cartridge latching mechanism. 3,599,895, Cl. 242-198.

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Jhawar, Pannalal Sohanlal, to Imperial Chemical Industries Limited. Gas-liquid contacting using silicone antifoaming agent in butadiene extraction. 3,600,454, Cl. 260-681.5

Joel, Henry G., to Olivetti, Ing. C., & C., S.p.A. Scanning optical system. 3,600,088, Cl. 355-47.

Johansson, Karl Gunnar Stig: *See—*
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Johnson, Fred I. High speed grouping conveyor. 3,599,777, Cl. 198-110.

Johnson, George R., to Arpax Company, The. Knock-down container. 3,599,822, Cl. 217-12.

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Jones, Marcus J.; and Michaluk, William, to Jones, C. & J. Limited. Dumping attachment for panel trucks. 3,600,038, Cl. 298-22.

Jones, Melvin R.; Peruzzi, Victor M.; and Peruzzi, Joseph G., to Victor Stanley, Inc. Convertible furniture. 3,600,034, Cl. 297-105.

Jones, Ralph S. Nut-mount for stringed instrument fingerboards. 3,599,524, Cl. 84-312.

Jones, Terry R. Flag storage and display housing. 3,599,599, Cl. 116-173.

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Judd, Malcolm L.; and Spangler, Fred W., to Eastman Kodak Company. Method of making a blend of fogged, direct positive silver halide emulsions of different Grain sizes. 3,600,180, Cl. 96-94.

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Kachnic, Joseph K. Self-contained combination central support member and utilities-entrance module for a rotatable building structure. 3,599,378, Cl. 52-29.

Kaess, Franz; Lienhard, Klaus; and Michaud, Horst. Process for preparing vinylidene fluoride. 3,600,450, Cl. 260-653.3

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Kammeraad, John H., to K-Line Tool Co. Valve seal. 3,599,992, Cl. 277-48.

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Kaplan, Asa; and Gill, Robert F., to General Electric Company. Cobalt-iron magnetic alloys. 3,600,162, Cl. 75-126.

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Kasselmann, John T., to Bendix Corporation, The. Antiskid brake system utilizing a pair of vortex valves. 3,600,043, Cl. 303-21.

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Kato, Sadamu: *See—*
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Katsumata, Takuma; and Ochi, Tetsuo, to Mitsubishi Jukogyo Kabushiki Kaisha. Method of and apparatus for heating a rotary roll. 3,600,550, Cl. 219-10.61

Kaufman, Karl L.; Martin, Doris N.; and Brown, William J., to CPC International Inc. Aerosol fabric de-wrinkler. 3,600,325, Cl. 252-305.

Kay Sjostrom: *See—*
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Kaye, Joseph & Company, Inc.: *See—*
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Kehoe, Edward C.; and Rinaldi, Robert, to Johns-Manville Corporation. Liquid purification system. 3,600,307, Cl. 210-33.

Kehrberger, Achim, to Delmag-Maschinenfabrik Reinhold Dornfeld. Coupling arrangements for drill rods of earth drilling tools. 3,599,445, Cl. 64-23.5

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Kelly, Donald P.; Powers, James A.; and Tucker, Philip A., to United States of America, Atomic Energy Commission. Plutonium heat source. 3,600,585, Cl. 250-106.

Kelsch, Robert J.; and Schmitt, Paul F., to Xerox Corporation. Time delay circuit for a radiant energy protective apparatus. 3,600,610, Cl. 307-293.

Kema Nord AB: *See—*
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King, John H., Jr., to International Business Machines Corporation. Recording and replication of arrays of holograms. 3,600,056, Cl. 350-3.5
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Kiwalle, Jozef; and Lamb, Frederick M., to Caterpillar Tractor Company. Spring actuated chuck assembly. 3,599,998, Cl. 279-51.
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Koletsos, Peter K.; and Dawson, Robert H., to Reliable Electric Company. Magazine and crimping machine for tubular electrical connectors. 3,599,472, Cl. 72-424.
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Krautzberger, Franz; and Geistbeck, Josef, to Voith, J. M. Gmbh. Coated head. 3,599,602, Cl. 118-410.
Krenke, Norman O.; and Ingram, Charles E., to Baker Perkins Inc. Container loading system. 3,599,390, Cl. 53-55.
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Kromrey, Robert V., to Aerojet-General Corporation. Ablative injectors. 3,599,430, Cl. 60-39.74
Kronig, Walter; and Frenz, Bruno Georg Gustav, deceased0 (by Frenz, Waltraud Evelin Ursula; acting legal representative), to Farbenfabriken Bayer Aktiengesellschaft. Production of organic esters in the presence of palladium on an alumina support in spinel form. 3,600,429, Cl. 260-475.
Kroon, Jacob, to N.V. Tot Aanneming Van Werken Voorheen H. J. Nederhorst. Method for providing a hole in the soil; as well as a device for applying said method. 3,599,732, Cl. 175-20.

Krueger, Robert K.; and Weinstein, Saul S., to Schlitz, Jos. Brewing Company. carbonate-Group-containing oxalic acid anhydride. 3,600,422, Cl. 260-463.

Kruspe, Henry R.; and Perkins, Norwood Kenneth, to International Business Machines Corporation. Measured review for disc-type dictation apparatus. 3,599,989, Cl. 274-14.

Krutova, Raisa Leonidovna; Muromtsev, Georgy Sergeevich; Pervy, Eleonora Nikolaevna; and Rakovsky, Jury Sergeevich. Method of isolating gibberellins from culture fluid obtained by cultivating a microorganism. 3,600,402, Cl. 260-343.3

Kruzan, Harold F.; and Johnson, Dwight N., to American Meter Company. Pressure regulator with internal relief valve. 3,599,658, Cl. 137-116.5

Kubo, Moritada; and Asano, Kuniji, to Tokyo Shibaura Electric Co., Ltd. Method for determining the degree of elongation of rolled magnetic metal strips and an apparatus for the same. 3,600,672, Cl. 324-34.

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Kuhn, Karl, to Societe d'Etudes de Machines Thermiques. Valve, in particular exhaust valve for an internal combustion engine or the like. 3,599,619, Cl. 123-188.

Kuhn, Stephen J.; and Ilavsky, Janet E., to Dow Chemical Company, The. 3-Oxopenta-1,4-dien-1,5-ylene)-bis-[p-phenylenecoxy) acetic acid]. 3,600,436, Cl. 260-520.

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Kuniyoshi Masateru, to Tokyo Shibaura Electric Co., Ltd. Brushless Motor including forced commutation responsive to rotor movement. 3,600,658, Cl. 318-254.

Kunze, Ernst-Guenter; Groepler, Rudi; Lauerbach-Lehmeier, Robert; and Toepper, Herbert, to Vickers-Zimmer Aktiengesellschaft Planung und Bau von Industrieanlagen. Pigment/polymer concentrate and method for its preparation and use. 3,600,354, Cl. 260-40.

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Kurczak, Walter J., to Mojonnier Bros. Co. High speed case sorting apparatus. 3,599,789, Cl. 209-74.

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Kushima, Teizo, to Minolta Camera Kabushiki Kaisha. Duplicating machine of reflex type. 3,600,084, Cl. 355-11.

Kushnick, Julian H., to Allied Chemical Corporation. Pressure relief bolt. 3,599,528, Cl. 85-62.

Kutsay, Ali Umit. Strain gage. 3,599,479, Cl. 73-885.

Kwolek, Stephanie Louis, to Du Pont de Nemours, E. I., and Company. Poly(p-benzamide)composition, process and product. 3,600,350, Cl. 260-32.6

Kyburg, Henry E. Safety air gun. 3,599,876, Cl. 239-291.

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La Conti, Anthony Basil, to General Electric Company. Multiple electrolyte high voltage cell. 3,600,228, Cl. 136-86.

LaCrue, Leonard. Wood floor finishing construction. 3,599,385, Cl. 52-460.

Lagstrom, Goran Emil. Central heating system. 3,599,582, Cl. 110-9.

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Landolf, Martin; Roth, Rudolf; Buechi, Paul; and Weber, Peter, to Aluminium AG Menziken. Warp beam flange. 3,599,893, Cl. 242-118.7

Langford, Le Roy, to Allis-Chalmers Manufacturing Company. Drive and steering mechanism for wheeled vehicles. 3,599,741, Cl. 180-6.48

Lanz, Walter. Method for more rapidly producing aeroconcrete building elements. 3,600,481, Cl. 264-42.

Lapitz, Theodore W., Jr., to Universal Oil Products Company. Metal clad laminates. 3,600,263, Cl. 161-93.

Lappo, Theodore S. Greeting card display tree. 3,599,360, Cl. 40-124.4

La Rocque, Armand P.; and Rogel, Alex, to United States of America, Army. Method of making chromium mask for photoresist application. 3,600,243, Cl. 156-3.

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Larson, Phyllis M. Disposable undergarment with absorption pad. 3,599,640, Cl. 128-286.

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Law, Stanley James; and Mackenzie, Ian Hugh, to Barr and Stroud Limited. Optical projection head. 3,600,065, Cl. 350-247.

Lawes, Michael John Anthony. Loose leaf binders. 3,599,294, Cl. 24-67.7

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Lawton, William R., to Bard Laboratories, Inc., mesne. Photochemical electrostatic copying sheet and process using free radicals. 3,600,169, Cl. 96-1.5

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Holdampf, Carl J.; and Murphy, Randal T., 3,600,033.

Lederer, Michael; and Sommer, Siegfried, to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning. Process for the manufacture of copolymer dispersions of high pigment tolerance. 3,600,343, Cl. 260-17.

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Logan, George H.; and Hultgren, Claes L., to Logan Engineering Co. Variable speed pulley drive. 3,599,505, Cl. 74-230.17
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Massie, Stephen N., to Universal Oil Products Company. Hydroxylation of aromatic compounds. 3,600,446, Cl. 260-613.
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Mayumi, Osamu; and Takahashi, Masaaki, to Kureha Kagaku Kogyo Kabushiki Kaisha. Process for producing hydrogenated alkyl tars. 3,600,298, Cl. 208-44.
Mc Bride, Lyle E., Jr.: *See—*
Obenhaus, Robert E.; and Mc Bride, Lyle E., Jr.,3,600,650.
McCall Printing Company, The: *See—*
Humphrey, Paul G.; and Bunting, Charles W., 3,599,965.
McCarrick, Terence E.; and Kessler, Norbert, to Black Clawson Company, The. Paper machine press section. 3,600,273, Cl. 162-273.
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McClain, John T., to Daniel Industries, Inc. Method and apparatus for linearizing the signal output of an LVDT responsive to non-linear input motion. 3,600,669, Cl. 323-51.

McCollum, James H., Jr., to Collins Radio Company. Power normalization of angular information from three-wire synchro source. 3,600,694, Cl. 329-50.

McCormick & Company Inc.: *See—*
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McCready, Donald K.: *See—*
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McCready, Donald K.: *See—*
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McCullough, Edward E., to Thiokol Chemical Corporation. Rocket control. 3,599,899, Cl. 244-3.22

McCusker, Edward Joseph: *See—*
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McDonald, David I., to Cincinnati Milling Machine Co., The. Clamping mechanism. 3,599,279, Cl. 18-30.

McDonnell, Bernard P.: *See—*
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McDonnell Douglas Corporation: *See—*
Busey, Harold M., 3,599,589.

McDougal, Harmon A.; and Whitney, Erwin C., to PPG Industries, Inc. Method of continuously casting a uniform metal film. 3,599,705, Cl. 164-87.

McDowell, Philip R.: *See—*
Budai, Robert E.; and McDowell, Philip R.,3,599,283.

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McFedries, Robert, Jr.; and Seidler, Don W., to Dow Chemical Company, The. Packaging film. 3,600,267, Cl. 16-165.

McGee, John K., to Giddings & Lewis Machine Tool Company. Phase comparator providing DC output as a function of variable phase between two inputs. 3,600,692, Cl. 328-134.

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McGuckin, Hugh G., to Eastman Kodak Company. Photographic production of electrically conducting metal layers. 3,600,185, Cl. 96-36.2

McHenry, Edwin J., to Bell Telephone Laboratories, Incorporated. Method for making cadmium electrodes for nickel- cadmium cells. 3,600,226, Cl. 136-24.

Mc Kinnis, Charles L.; and Cohen, Charles I. Method of making a glass semipermeable membrance. 3,600,147, Cl. 65-31.

McLaren, Robin A.: *See—*
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McMahon, Donald H., to Sperry Rand Corporation. Continuously blazed optical monochromator. 3,600,093, Cl. 356-100.

McMillen, James M., to Mobil Oil Corporation. Alternate flood process for recovering petroleum. 3,599,717, Cl. 166-273.

McMullen, Larry Gene, to Deere & Company. Pivot pin structure. 3,600,015, Cl. 287-100.

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McNeilly, Joseph H.; Blashfield, William H.; and Manship, Roger A., to North Electric Company International Standard Electric Corporation. Dial speed tester Subscriber subset for PCM telephone system. 3,600,527, Cl. 179-15.

McNeilly, Joseph Hood: *See—*
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Meisingset, Lars: *See—*
Romer, Bendt Wegge; Meisingset, Lars; Valbjorn, Knud V.; and Knudsen, Jorgen Dahlman,3,600,110.

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Melion, Ludwig, to Luwa AG. Controllable compressor cooling installation. 3,599,440, Cl. 62-158.

Melton, Raymond L. Golf ball dispenser. 3,599,983, Cl. 273-201.

Menke, Josef-Ferdinand, to Eltro GmbH. IR-optical image reproducing system and method. 3,600,581, Cl. 250-83.

Mennuto, Anthony R.; and Popovich, Nicholas, said Popovich, Nicholas, assor. to said Mennuto, Anthony R. Insulated storm door assembly. 3,599,703, Cl. 160-90.

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Merrick, John T. Vacuum mop. 3,599,272, Cl. 15-321.

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Messman, Roger L.; Becker, Karl E.; and Messman, Henry C. Method of recovering hydrocarbons by in-situ combustion. 3,599,714, Cl. 166-258.

Messrs. Horst Nauditt Roland-Sirenbau-Electronic- schiffau: *See—*
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Met-Pro Water Treatment Corporation: *See—*
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Metabowerke Kg Closs, Rauch & Scnizler: *See—*
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Metropolitan Waste Conversion Corporation: *See—*
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Mevenkamp, Paul; and Marsch, Hans-Dieter, to Friedrich Uhde GmbH. Tube furnace for recovery of synthesis gases from hydrocarbon cracking. 3,600,141, Cl. 23-288.

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Meyers, Dale J.; and Ditty, James E., to Goodyear Tire & Rubber Company, The. Apparatus for molding foam articles. 3,599,282, Cl. 18-5.

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Ronzoni, Isidoro; and Miani, Mario,3,599,292.

Michael, John Graham. Jewelry piece. 3,599,359, Cl. 40-10.

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Michniewicz, Edward J., to Argus Incorporated. Slide feeding apparatus. 3,600,078, Cl. 353-112.

Miciukiewicz, Joseph F., to Pitney Bowes, Inc. Paper tray for photocopy machine. 3,599,972, Cl. 271-39.

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Millan, Alwin S., Jr.; and Resnick, Paul R., to Du Pont de Nemours, E. I., and Company. Process for synthesizing hexafluoropropylene epoxide. 3,600,409, Cl. 260-348.5

Millen, John Eugene. Method and instrument for determining the pulse rate of a person with an implanted heart pacer. 3,599,627, Cl. 128-2.05

Miller, Christian F., to V.C.A. Corporation, formerly k/a Valve Corporation of America, mesne. Container closure. 3,599,845, Cl. 222-521.

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Milliken, Paul E.: *See—*
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Millman, Victor, to Rohr Corporation. Jet noise control system. 3,599,749, Cl. 181-33.

Milloy, Avery D.; and Kerr, Edwin R., to Texaco Inc. Short cycle catalytic dehydrogenation of alkanes. 3,600,457, Cl. 260-683.3

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Minnesota Mining & Manufacturing Company: *See—*
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Minnesota Mining and Manufacturing Company: *See—*
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Hawkins, Paul Maddison, 3,600,021.
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Minolta Camera Kabushiki Kaisha: *See—*
Kushima, Teizo, 3,600,084.
Morioka, Yukihiro, 3,599,971.

Miranda, Thomas J., to O'Brien Corporation, The. Novel thiourethane-urethane acrylates. 3,600,359, Cl. 260-77.5

Mirza, Haider Beg; and Zaim, Semih, to Polymer Corporation. Process of preparing ethylene copolymers. 3,600,364, Cl. 260-80.78

Misenti, Angelo J., to Combustion Engineering, Inc. Control rod drive mechanism. 3,599,498, Cl. 74-25.

Missud, Louis. Device for confining oil released by leakage during offshore oil drilling operations. 3,599,434, Cl. 61-46.

Mitarai, Motoshi: *See—*
Fukushima, Michio; and Mitarai, Motoshi,3,600,335.

Mitsubishi Denki Kabushiki Kaisha: *See—*
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Mitsubishi Jukogyo Kabushiki Kaisha: *See—*
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Mitsubishi Rayon Company, Limited: *See—*
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Mitsumori, Teruhisa: *See—*
Moriguchi, Eichi; Goto, Takeshi; Hiraoka, Michikazu; Mitsumori, Teruhisa; and Rokudo, Shonosuke,3,600,466.

Mizoguchi, Hideo: *See—*
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Mlachnik, Albert A.: *See—*
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Mobil Oil Corporation: *See—*
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McMillen, James M., 3,599,717.

Mocotte, Jacques: *See—*
Gonthier, Beatrice; and Mocotte, Jacques,3,600,198.

Moe, Richard G.; Sieren, Gerald E.; and Walberg, Maynard E., to Allis-Chalmers Manufacturing Company. Plow trip mechanism. 3,599,728, Cl. 172-265.

Mohrman, Richard C., to Bausch & Lomb Incorporated. Optical alignment method and apparatus. 3,600,098, Cl. 356-153.

Moiriat, Maurice, to Gaymor Trailers Limited. Detachable gooseneck trailers. 3,599,816, Cl. 214-506.

Moisson-Franckhauser, Francois: *See—*
Aupoix, Marcel; Moisson-Franckhauser, Francois; and Royet, Jean,3,600,498.

Mojonnier, Albert B.; Schlussman, Gilbert M.; and Lowe, Harry E., III, to Mojonnier, Albert, Inc. Method for heat sealing thermoplastic bodies. 3,600,248, Cl. 156-69.

Mojonnier, Albert, Inc.: *See—*
Mojonnier, Albert B.; Schlussman, Gilbert M.; and Lowe, Harry E., III, 3,600,248.

Mojonnier Bros. Co.: *See—*
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Moleerstedt, Bengt Olof Pontus; and Johansson, Karl Gunnar Stig, to Kema Nord AB. Crystallization method. 3,599,701, Cl. 159-47.

Molnar, Louis; and Heitmann, William E., to Inland Steel Company. Hot-workable steel with sulfur and vanadium. 3,600,158, Cl. 75-123.

Molotsky, Hyman M., to CPC International Inc. Polyurethane resins. 3,600,338, Cl. 260-2.5

Mono Pumps Limited: *See—*
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Monsanto Company: *See—*
Carter, Ernest P., 3,599,679.
Daniels, Brian K.; Preston, Jack; and Zaukelies, David A., 3,600,269.
Lee, Yoon Chai, 3,600,461.
Nickerson, Ralph F.; and Weymouth, Harold D., 3,600,342.
Timbie, Robert W., 3,599,300.

Monsanto Research Corporation: *See—*
Salyer, Ival O.; and Schwendeman, James L., 3,600,482.

Monte, Ernest, to Sunbeam Lighting Co., Inc. Means for end-to-end assembly of elongated fluorescent lamp ceiling fixtures. 3,599,911, Cl. 248-50.

Montecatini Edison S.p.A.: *See—*
Ronzoni, Isidoro; and Miani, Mario, 3,599,292.

Montgomery, Robert E.: *See—*
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Moore, Alvin Edward: *See—*
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Moore, John Alan: *See—*
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Moore, John F., to Lockheed Aircraft Corporation. Fiber optics pulse width modulator. 3,600,594, Cl. 250-227.

Moore, Paul A.: *See—*
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Moore Reed (Industrial) Limited: *See—*
Evans, David Silvester, 3,600,564.

Moore, Robert Fred; and Moore, Alvin Edward. Pile-and-concrete connector. 3,599,383, Cl. 52-250.

Moore, Robert Linus: *See—*
De Forest, Raymond Abbott; and Moore, Robert Linus,3,600,239.

Moore, William H.; and Gruver, Walter E., Jr. Nodular cast iron containing silicon and vanadium. 3,600,159, Cl. 75-123.

Mordvintsev, Leonid Alexandrovich: *See—*
Olshansky, Nikolai Alexandrovich; and Mordvintseva, Alexandra Vladimirovn,3,600,549.

Mordvintseva, Alexandra Vladimirovn: *See—*
Olshansky, Nikolai Alexandrovich; and Mordvintseva, Alexandra Vladimirovn,3,600,549.

Morey, Mariano G., to Manufacturas de Precision S.A. Apparatus for the selection of fruits. 3,599,790, Cl. 209-124.

Morgan, Lester A. Means providing a holding device. 3,599,961, Cl. 269-275.

Mori, Yoichi, to Nissan Motor Company, Limited. Windshield wiper. 3,599,270, Cl. 15-250.23

Moriguchi, Eichi; Goto, Takeshi; Hiraoka, Michikazu; Mitsumori, Teruhisa; and Rokudo, Shonosuke, to Denki Kagaku Kogyo Kabushiki Kaisha. Process for the preparation of pure-white polystyrene compositions. 3,600,466, Cl. 260-880.

Morimoto, Masanobu: *See—*
Sato, Koichi; Niki, Akira; and Morimoto, Masanobu,3,600,469.

Morioka, Yukihiro, to Minolta Camera Kabushiki Kaisha. Device for automatically feeding photosensitive paper in a copying machine. 3,599,971, Cl. 271-36.

Morison, Charles R. W., to Union Carbide Corporation. Paint removal formulation. 3,600,322, Cl. 252-171.

Morita, Tarou. Miniature motor. 3,600,615, Cl. 310-40.

Morrett, James A., Jr. Warped plane berm. 3,599,542, Cl. 94-1.

Morris, Carrol V.: *See—*
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Morris, Charles O. Fire hose connector. 3,600,007, Cl. 285-35.

Morris, Robert T.; Palmer, Jack M.; Riley, George F.; and Smith, Derek F., to Rohr Corporation. Combination pallet and box assembly. 3,599,823, Cl. 220-4.

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Morton, Harold: *See—*
Briggs, Leonard A.; Morton, Harold; and Swiderski, Jan,3,600,661.

Morton, Henry C., to Bendix Corporation, The. Friction facing comprising a tape of material of at least one strand of glass yarn and at least one strand of asbestos yarn in side-by side relationship. 3,600,258, Cl. 161-42.

Mory, Rudolf, to Ciba Limited. Phenyl-azo-naphthoic acid amide pigments containing a naphthostyril group. 3,600,374, Cl. 260-152.

Moskal, Max D., to Continental Can Company, Inc. Method of joining cemented carbide to steel. 3,599,316, Cl. 29-473.1

Moskowitz, Arthur, to United States of America, Navy. Educational device for use in conversion between numbers systems. 3,599,350, Cl. 35-30.

Moss, Jack W., to Wichita Clutch Company, Inc. Spring set fluid release brake. 3,599,760, Cl. 188-170.

Mostecky, Jiri; Stanek, Milan; Koudela, Zdenek; and Schierova, Eva, to Lachema, narodni podnik. Method of producing a descaling composition from sodium hydroxide, sodium and hydrogen under pressure. 3,600,316, Cl. 252-80.

Motorola, Inc.: *See—*
Cherry, James R., 3,600,684.
Foreman, Roland J.; and Warner, William J., 3,599,615.
Huber, William B., 3,599,985.
Schutte, Gunter, 3,599,618.

Moyer, Ronald C.: *See—*
Holland, Dewey G.; Moyer, Ronald C.; Polevy, John H.; and Walde, Robert A.,3,600,433.

Mucke, Bruno: *See—*
Matejec, Reinhard; Meyer, Rudolf; and Mucke, Bruno,3,600,182.

Mueller, Bert A. Collapsible sawhorse and tray. 3,599,751, Cl. 182-129.

Muench, Charles A., Jr., to Integrated Systems, Inc. Protective control circuit against transient voltages. 3,600,634, Cl. 317-16.

Muhlberg, Wolfgang. Process for measurements of longitudinal stresses in metal bands under longitudinal tension. 3,599,485, Cl. 73-144.

Muhler, Joseph C., to Indiana University Foundation. Dental prophylaxis implement. 3,599,333, Cl. 32-59.

Muller, Johann, to Friedrich Deckel Prazisions Mechanik und Maschinenbau. Boring and facing head for machine tools. 3,599,517, Cl. 82-2.

Mulligan, Randy Lee. Vacuum tube pulling tool. 3,599,309, Cl. 29-203.

Multiscreen Corporation Limited: *See—*
Shaw, William Chester, 3,600,073.

Munch, Walter; and Bachmann, Wilhelm, to Schilds Aktiengesellschaft. Device for continuously loading strip form material onto a conveyor belt of a dryer or the like. 3,599,853, Cl. 226-171.

Munters, Carl Georg. Liquid and gas contact apparatus. 3,599,943, Cl. 261-95.

Munzel, Kurt: *See—*
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Murai, Koichi; Akazome, Giichi; Murakami, Yasuto; Tabata, Koichi; Oka, Yoshio; and Fujita, Akira, to New Japan Chemical Company Limited. Liquid curing agents for polyepoxides comprised of a mixture isomers of tetrahydrophthalic anhydride and hexahydrophthalic anhydride. 3,600,356, Cl. 260-47.

Murakami, Yasuto: *See—*
Murai, Koichi; Akazome, Giichi; Murakami, Yasuto; Tabata, Koichi; Oka, Yoshio; and Fujita, Akira,3,600,356.

Murata, Takao; and Kudo, Atsushi, to Sumitomo Durez Company, Ltd. Method of soil stabilization and leakage prevention. 3,599,433, Cl. 61-36.

Murata, Yukio, to Sumitomo Chemical Company, Ltd. Apparatus for measuring density stimulus values of three primary colors. 3,600,092, Cl. 356-92.

Murawski, Steve A. Combination hands and feet swimming fins. 3,599,258, Cl. 9-307.

Muromtsev, Georgy Sergeevich: *See—*
Krutova, Raisa Leonidovna; Muromtsev, Georgy Sergeevich; Pervy, Eleonora Nikolaevna; and Rakovsky, Jury Sergeevich,3,600,402.

Murphy, Randal T.: *See—*
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Myers, Lester L. Mobile Aerial Towers, Inc. Torque Motor. 3,599,536, Cl. 91-480.

Myrick, Glen H. Automatic controls for sewing machines. 3,599,585, Cl. 112-217.3

Nagel, Rudolph. Pecan retriever. 3,600,029, Cl. 294-19.

Nagel-Chase Manufacturing Company: *See—*
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Naiman, Michael I.; Heintzelman, William J.; and McLaren, Robin A., to Petrolite Corporation. Hydrocarbon systems containing branched alkylene polymers. 3,600,311, Cl. 252-59.

Nakabayashi, Nobuo: *See—*
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Nakada, Seiji, to Nippon Gakki Seizo Kabushiki Kaisha. Keying switch assembly. 3,600,543, Cl. 200-166.

Nalco Chemical Company: *See—*
Svarz, Jerry J.; Goretta, Louis A.; and Hunter, Wood E., 3,600,398.

Nara, Jiyuichi. Apparatus for drying pulverant materials. 3,599,344, Cl. 34-57.

Narco Scientific Industries, Inc.: *See—*
Wipff, Frank P., 3,599,910.

Natali, Paul W.: *See—*
Tedeschi, Robert J.; and Natali, Paul W.,3,600,321.

Nathanson, Harvey C.; and Davis, John R., Jr., to Westinghouse Electric Corporation. Localized machining and deposition for microelectronic components by sputtering. 3,600,292, Cl. 204-192.

National Cash Register Company, The: *See—*
Churchill, Donald; and Cartmell, James V., 3,600,060.
Maierson, Theodore, 3,599,859.

National Engineering Company: *See—*
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National Research Development Corporation: *See—*
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National Tel-Tronics Corporation: *See—*
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Hoegerl, Otto, 3,600,531.

Negishi, Hirokazu: *See—*
Tosaka, Umi; Sano, Yozo; Matsuo, Takehiko; Negishi, Hirokazu; Ikuta, Tamao; Yamaguchi, Masaru; and Hattori, Setsuko,3,600,256.

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Neidig, Willem Pieter; and Termeer, Petrus Johannes Joseph, to U.S. Philips Corporation. Amplifier provided with automatic level control. 3,600,698, Cl. 330-28.

Neilson, John Manning Savidge, to RCA Corporation. Protection circuit including a thyristor and a three terminal device. 3,600,635, Cl. 317-33.

Nelsen, Roger Jacob: *See—*
Armbruster, Ronald Herman David; and Nelsen, Roger Jacob,3,600,545.

Nelson, Norman A., to Upjohn Company, The. 6,11-Spirocyclopropyl compounds of the androstane series. 3,600,412, Cl. 260-397.4

Nelson, William T.: *See—*
Johnson, Marvin M.; and Nelson, William T.,3,600,145.

Neptune Meter Company: *See—*
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Neumayerm, Jack M.: *See—*
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New Japan Chemical Company Limited: *See—*
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Newalls Insulation & Chemical Company Limited: *See—*
Trickett, Kenneth; and Forsyth, Thomas Leslie, 3,600,274.

Newgard, Peter M.; and Brain, Alfred E., to United States of America, Air Force. High data rate optical communication system. 3,600,507, Cl. 178-6.

Newkirk, Clarence E. Trailer coupling device. 3,600,004, Cl. 280-406.

Newman, Albert L., to Singer Company, The. Bobbin thread depletion detector for sewing machines. 3,599,586, Cl. 112-218.

Newman, Stanley F.: *See—*
Foster, E Gordon; Newman, Stanley F.; and Overcashier, Robert H.,3,600,440.

Nicholas, Gordon J.; and Kupka, Edward P., to General Motors Corporation. Wound rotor alternator coil slot construction. 3,600,618, Cl. 310-216.

Nickerson, Ralph F.; and Weymouth, Harold D., to Monsanto Company. Polyvinyl alcohol-glyoxal-polyol adhesive composition. 3,600,342, Cl. 260-17.

Nickles, David E.: *See—*
Billingsley, John G. S.; and Nickles, David E.,3,600,490.

Niebisch, Gunter, to Otto Hansel GmbH. Apparatus for withdrawal of viscous or pulpy hard sugar masses from open spaces under vacuum, in particular in cooking machines. 3,599,577, Cl. 107-4.

Nielsen, Alfred Thygesen, to Unidry K/S Engineering and Development Group Copenhagen. Drying apparatus, particularly for drying green crops intended to be made into briquettes. 3,599,343, Cl. 34-52.

Niewulis, Albin J., to Hoover Ball and Bearing Company. Frame rail attachment for seating structures. 3,599,254, Cl. 5-264.

Nihon Denshi Kabushiki Kaisha: *See—*
Watanabe, Eiji, 3,600,573.

Niki, Akira: *See—*
Sato, Koichi; Niki, Akira; and Morimoto, Masanobu,3,600,469.

Nims, John B., Jr. Fuel systems for nuclear reactors. 3,600,276, Cl. 176-28.

Nimtz, Klaus; and Franzen, Gustav, to Palitex Project Company G.m.b.H. Apparatus on a double twist spindle frame for supplying the spindles with bobbins and for carrying away the empty yarn carriers. 3,599,413, Cl. 57-53.

Nippon Carbon Company: *See—*
Ishikawa, Toshikatsu; Tomoeda, Munenori; and Kanemaru, Toyonosuke, 3,599,601.

Nippon Denso Kabushiki Kaisha: *See—*
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Nippon Electric Company: *See—*
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Nippon Electric Company, Limited: *See—*
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Nippon Gakki Seizo Kabushiki Kaisha: *See—*
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Nippon Gohsei Kagaku Kogyo Kabushiki Kaisha: *See—*
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Nippon Piston Ring Co., Ltd.: *See—*
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Nippon Steel Corporation: *See—*
Inouye, Katsuya; Okada, Hideya; Hosoi, Yuzo; and Yukawa, Kenichi, 3,600,161.

Nissan Motor Company, Limited: *See—*
Mori, Yoichi, 3,599,270.

Nissin Shokuhin Kaisha Ltd.: *See—*
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Nitto Electric Industrial Co., Ltd.: *See—*
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Nitto Kasei Co., Ltd.: *See—*
Seki, Toshio; Suzuki, Kozaburo; and Matsuzaki, Takashi, 3,600,397.

Niwa, Toshio; Kimoto, Yasuo; Tamiya, Katsunori; and Okamura, Hisashi, to Hitachi Shipbuilding and Engineering Co., Ltd. Electrical discharge treatment and machining apparatus. 3,600,546, Cl. 219-69.

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Noland, William P.; and Layman, Glenn W. Tamper proof seal. 3,600,027, Cl. 292-322.

Nolken, Ernst: *See—*
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Noller, Hans Gunter, to Corning Glass Works. Method for the determination of alcohol and other oxidizable organic compounds in respired air and body fluids. 3,600,134, Cl. 23-232.

Nomura, Yoichi: *See—*
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Nordisk Ventilator Co., A/S: *See—*
Kristiansen, Svend Helge, 3,599,865.

Norris, Elwood G.: *See—*
Norris, Elwood G., 3,599,988.

Norris, Elwood G., to Norris, Elwood G., mesne. Semi-automatic phonograph with radial arm. 3,599,988, Cl. 274-9.

Norris Industries, Inc.: *See—*
Armstrong, Richard L., 3,600,022.

North American Rockwell Corporation: *See—*
Cox, Frank T., Jr.; and Svenson, Robert R., 3,599,762.
Harrison, George; and Harrison, Nelson K., 3,599,314.
Richardson, Donald, 3,599,529.
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Northlite Industries Incorporated: *See—*
Novak, Thomas L.; and Novak, Stanley, 3,599,352.

Northrop Corporation: *See—*
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Norton Company: *See—*
Karet, James M., 3,599,286.

Novak, Stanley: *See—*
Novak, Thomas L.; and Novak, Stanley,3,599,352.

Novak, Thomas L.; and Novak, Stanley, to Northlite Industries Incorporated. Snowshoe. 3,599,352, Cl. 36-4.5

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Nulcan Materials Company: *See—*
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Nunemaker, Frank D. Sand blasting device. 3,599,375, Cl. 51-8.

Nuter, Andrew G.; and Mackowan, Theodore. Air release valve. 3,599,659, Cl. 137-202.

N.V. Tot Aanneming Van Werken Voorheen H. J. Nederhorst: *See—*
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Nye, Allan R.: *See—*
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Nystrand, Ernst Daniel; and Broeren, Thomas E., to Paper Converting Machine Company, Inc. Apparatus for forming fluff. 3,599,293, Cl. 19-155.

Nystrand, Ernst Daniel: *See—*
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Obenhaus, Robert E.; and Mc Bride, Lyle E., Jr., to Texas Instruments, Incorporated. Protected semiconductor device having sensor thermally coupled to electrode. 3,600,650, Cl. 317-235.

Oberdorfer, Guido. Car washing apparatus adapted for mounting on the vehicle to be washed. 3,599,869, Cl. 239-172.

Oberdorfer, Paul E., Jr., to Sun Oil Company. Motor vehicle emission control system. 3,599,426, Cl. 60-29.

Oberle, Theodore L.: *See—*
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O'Brien Corporation, The:*See—*
Miranda, Thomas J., 3,600,359.

O'Brien, Louis M. Trailer-type liquid carrier and mixer. 3,599,939, Cl. 259-10.

O'Brien, Patrick W., to Compoflex Company Limited of Lumb Hill. Flexible tubing and the manufacture thereof. 3,599,677, Cl. 138-122.

Ochi, Tetsuo: *See—*
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O'Connor, Francis M.:*See—*
Bailey, Donald L.; and O'Connor, Francis M.,3,600,418.

O'Connor, John J.:*See—*
Rubin, Bernard; and O'Connor, John J.,3,600,294.

Oda, Mitsuo: *See—*
Suzuki, Kazuro; Oda, Mitsuo; and Suzuki, Takao,3,599,708.

O'Donnell, Thomas P. Attachably adapted clamp and writing platform therefor. 3,599,295, Cl. 24-67.7

Oertel, George W.; and Munzel, Kurt, to Hoffmann-La Roche Inc. Medicament preparation and process for the manufacture thereof. 3,600,495, Cl. 424-31.

Oglesby, Paul L.; Reeves, Richard E.; and Haebich, William K., to Decatur Pump Company. Compact high temperature pump. 3,600,101, Cl. 415-111.

Oguey, Henri, to Centre Electronuque Horloger S.A. Electro-mechanical timepiece. 3,599,420, Cl. 58-23.

Oishi, Kazuo; and Kurebayashi, Tokuhiro, to Nippon Denso Kabushiki Kaisha. Ignition system for internal combustion engines. 3,599,616, Cl. 123-148.

Oka, Yoshio: *See—*
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Okada, Hiroshi; and Osakada, Atsushi, to Toray Industries, Inc. Polyamide resin foam and a method of preparing the same. 3,600,336, Cl. 260-2.5

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Oldham & Son Limited: *See—*
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Oldham, Millard L.: *See—*
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Olin Corporation: *See—*
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Franco, Nicholas B.; and Robinson, Martin A., 3,600,419.

Olin Mathieson Chemical Corporation: *See—*
Shellnutt, Richard J.; and Jenkins, Earl R., 3,599,568.

Oliver, Clark E. Collet stop. 3,599,997, Cl. 279-1.

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Ollendorf, Joel: *See—*
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Olshansky, Nikolai Alexandrovich; and Mordvintseva, Alexandra Vladimirovn, deceased0 (by Mordvintsev, Leonid Alexandrovich; administrator). Method of the arc welding and deposition of metals in vacuum. 3,600,549, Cl. 219-137.

Olympia Werke AG: *See—*
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Olympus Optical Company, Ltd.: *See—*
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Omark-Winslow Aerospace Tool Co.: *See—*
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Ono, Terumichi; Haga, Tsuneo; Takagi, Yasuo; and Higuchi, Tomitake, to Toray Industries, Inc. Crimped thermoplastic filament having a tow phase cross-section. 3,600,271, Cl. 161-173.

Ontario Research Foundation: *See—*
Campbell, Hugh J. E., 3,600,123.

Optotechnik G.m.b.H.: *See—*
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Orenberg, Arthur, to RCA Corporation. Frequency synthesizer having a plurality of cascaded phase locked loops. 3,600,699, Cl. 331-2.

Organon Inc.: *See—*
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Original Hanau Quarglampen GmbH: *See—*
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Ormiston, Robert A.: *See—*
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Ornbaek, Frederik Otto. Method of preserving potatoes and other root vegetables by freezing and cold storage. 3,600,199, Cl. 99-193.

Osa, Yuko; and Hara, Okitada, to Ishikawayima-Harima Jukogyo Kabushiki Kaisha. Device for continuously molding hollow articles from thermoplastic material. 3,599,284, Cl. 18-5.

Osakada, Atsushi: *See—*
Okada, Hiroshi; and Osakada, Atsushi,3,600,336.

Osborn, George M. Bicycle rack. 3,599,798, Cl. 211-20.

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Osojnak, Boris M., to Engineered Data Products, Inc. Tape cannister. 3,599,786, Cl. 206-52.

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Ott, Karl-Heinz: *See—*
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Otto Hansel GmbH: *See—*
Niebisch, Gunter, 3,599,577.

Outboard Marine Corporation: *See—*
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Overcashier, Robert H.: *See—*
Foster, E Gordon; Newman, Stanley F.; and Overcashier, Robert H.,3,600,440.

Ovitron Corporation: *See—*
Jaeger, Walter; and Keilpart, Theo H., 3,599,398.

Owen, Joseph R.; and Kulik, John J., to United States of America, Navy. Close viewing TV for simulators. 3,600,510, Cl. 178-6.8

Owens-Corning Fiberglas Corporation: *See—*
Thumm, J Randall; Smock, George E.; and Pitt, Richard E., 3,599,848.

Owens-Corning Fiberglass Corporation: *See—*
Hill, Homer G., 3,599,418.

Owens-Illinois, Inc.: *See—*
Sorbie, Thomas B., 3,599,780.

Paaskesen, Julius Barclay Estrup. Apparatus for preparing dough pieces in spaced relationship for baking. 3,599,579, Cl. 107-69.

Packaging Frontiers, Inc.: *See—*
James, Robert C., 3,599,387.

Padgett, Clifford A.; and Slade, Lester C., to Raymond International, Inc. Lining machine. 3,599,299, Cl. 25-38.

Pahl, Hans Gunther; and Woods, Stanley George, to Mono Pumps Limited. Rotary pump or motor with an axially rotating rotor. 3,600,113, Cl. 418-48.

Paiva, Antonio S.; and Paulauskas, Justin V., to Weston Instruments, Inc. Electrical indicating instruments. 3,600,077, Cl. 353-40.

Palitex Project Company G.m.b.H.: *See—*
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Palmer, Jack M.: *See—*
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Palmer, Paul Grenville: *See—*
Darcy, Jules; and Palmer, Paul Grenville,3,600,467.

Palmeth, Torsten Birger: *See—*
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Panas, Joseph F., to United States of America, Air Force, mesne. Thermoelectric cooling device. 3,599,437, Cl. 62-3.

Paper Converting Machine Company, Inc.: *See—*
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Spencer, Harvey J.; and Nystrand, Ernst Daniel, 3,599,805.

Park, Samuel J.: *See—*
Hagemeyer, Hugh J., Jr.; Hull, David C.; and Park, Samuel J.,3,600,463.
Parker, Rollin J., to General Electric Company. Speaker magnet assembly. 3,599,322, Cl. 29-594.
Parmelee, Bruce R., to Rockwell Manufacturing Company. Pipe cleaning. 3,600,225, Cl. 134-10.
Parsons, Joseph R., to Chicago Tire Brick Company. Process for repairing runners for handling molten metal. 3,600,480, Cl. 264-30.
Patchett, Charles B. Clip for decorative lights and the like. 3,599,918, Cl. 248-215.
Patterson-Kelley Co., Inc., The: *See—*
Fischer, John J., 3,599,709.
Patton, John T., Jr.; and Pizzini, Louis C., to BASF Wyandotte Corporation. Polyurethane foam. 3,600,340, Cl. 260-2.5
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Paulin, Dieter: *See—*
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Pauly, Ronald R.; and Good, Thomas W., to Tonka Corporation. Axle mounting for toy vehicles. 3,599,366, Cl. 46-221.
Pavlichenko, Alexandr Andreevich; and Frolov, Andrei Yakovlevich. Arrangement to seal the shaft of a drilling face engine. 3,600,109, Cl. 417-297.5
Paynter, Donald A., to EG&G, Inc. Apparatus and methods for reading thermoluminescent dosimeters and the like. 3,600,583, Cl. 250-83.3
Pearson, Neville Barry, 1/2 to Rose, Samuel Montague. Pressure fluid operated tool. 3,599,854, Cl. 227-7.
Peebles, David Meade. Holding means for picture supports. 3,599,686, Cl. 145-46.
Peil, Archie W.: *See—*
Slator, Damon T.; Lee, William T.; and Peil, Archie W.,3,599,735.
Pellicer, Emil Stanley. Silhouette fincing target. 3,599,975, Cl. 273-1.
Pelly, Brian R.; and Osman, Richard H., to Westinghouse Electric Corporation. Firing circuit for gate controlled power switches. 3,600,665, Cl. 323-16.
Pendred, Charles R.; Plank, Karl-Ludwig; Reher, Hans-Wilhelm; Petty, Stephen Marrs; and Schosnig, Johannes-Georg, to RCA Corporation. Telephone exchange arrangements with central Process for rapid recording of polygonal images control. 3,600,521, Cl. 179-18.
Penn Controls, Inc.: *See—*
Lewis, Dwight C.; and Wilder, Justin E., 3,599,439.
Pennebaker, William B., to International Business Machines Corporation. Method for depositing insulating films of silicon nitride and aluminum nitride. 3,600,218, Cl. 117-93.1
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Pennzoil United Inc.: *See—*
Drechsel, Erhart K.; and Sardisco, John B., 3,600,152.
Peoples, Lawrence, to Dow Chemical Company, The. Method for saturated liquid aerosol formulations. 3,599,940, Cl. 259-18.
Perkin-Elmer Corporation, The: *See—*
Abbott, Howard M., Jr., 3,600,119.
Perkins, Melvin L.; and Sherman, Robert, to United Aircraft Corporation. Flow divider for throttles. 3,599,652, Cl. 137-2.
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Permaglass, Inc.: *See—*
Liddle, David E., 3,599,864.
Pernau, Franz; and Klerr, Karl, to Semperit Osterreichisch-Amerikanische Gummiwerke Aktiengesellschaft. Tire shoulder testing machine. 3,599,486, Cl. 73-146.
Perrella, Guido, to Dynacast International Limited, mesne. Apparatus for brushing and polishing zipper chain. 3,599,266, Cl. 15-21.
Perry, Sidney L. Portable tent apparatus. 3,599,651, Cl. 135-1.
Persson, Bo K. G., to Trelleborgs Gummifabriks Aktiebolag. Methods of providing walls with wear-resistant linings. 3,599,827, Cl. 220-63.
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Peruzzi, Victor M.: *See—*
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Pervy, Eleonora Nikolaevna: *See—*
Krutova, Raisa Leonidovna; Muromtsev, Georgy Sergeevich; Pervy, Eleonora Nikolaevna; and Rakovsky, Jury Sergeevich,3,600,402.
Peters, Robert W., to Lincoln Tool & Manufacturing Co. Method for winding stator coils. 3,599,324, Cl. 29-596.
Petersen, Tom Kastrup, to Danfoss A/S. Electrical apparatus comprising a power section and a control section with fluid cooling. 3,600,636, Cl. 317-100.
Peterson, Rudolph A.: *See—*
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Petro-Tex Chemical Corporation: *See—*
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Pfaff, Ernest H.; and Mills, Thomas F., Jr., to Pfaff, Jeanne. Method and apparatus for electronic sensing or motor torque. 3,600,657, Cl. 318-218.
Pfaff, G. M., AG.: *See—*
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Pfaff, Jeanne: *See—*
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Pfeil, William C., Jr.: *See—*
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Philco-Ford Corporation: *See—*
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Philippaerts, Herman Adelbert; Ghys, Theofiel Hubert; and Depoorter, Henri, to Gevaert-Agfa N.V. Light-sensitive material. 3,600,183, Cl. 96-123.
Phillips, John R. Screw clamp. 3,599,960, Cl. 269-182.
Phillips, Kenneth G. Nalco Chemical Company Method of utilizing piperidine as a condensate corrosion inhibitor. 3,600,125, Cl. 21-217.
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Fodor, Lawrence M., 3,600,370.
Holtz, Hans D., 3,600,384.
Johnson, Marvin M.; and Nelson, William T., 3,600,145.
Lupfer, Dale E.; and Hobbs, James W., 3,600,282.
Marwil, Stanley J., 3,600,371.
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Phy, William S., to Fairchild Camera and Instruments Corporation. Cutting apparatus for making finely controlled cuts utilizing a tiltable wheel for regulating the cutting blade movement. 3,599,623, Cl. 125-21.
Piazze, Thomas E., to Continental Can Company, Inc. Three dimensional bag forming method and apparatus. 3,599,538, Cl. 93-33.
Piccardo, Jack E., to Grove Valve and Regulator Company. Rotary valve bearing assembly. 3,599,933, Cl. 251-309.
Pickett, John E. P. Disposable blade and holder for microtome. 3,599,523, Cl. 83-412.
Pickle, Linwood A., to Worthington Compressor and Engine International, division of Worthington Corporation. Rock drill feed mast with integral muffler and oil separator. 3,599,756, Cl. 181-36.
Pierlornzi, Paolo: *See—*
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Pilkington Brothers Limited: *See—*
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Pilkinton, Donald C.; and Goodman, David M., to Bell Telephone Laboratories, Incorporated. Dial pulse decoders Timed insertion bridge. 3,600,517, Cl. 179-5.5
Pilvet, Aksel, 2/3 to Knaul, Sigmund. Tumbler lock. 3,599,455, Cl. 70-363.
Pinckaers, Balthasar H., to Honeywell Inc. Electric clock thermostat having phase responsive control apparatus. 3,599,863, Cl. 236-46.
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Pitney-Bowes, Inc.: *See—*
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Pitt, Richard E.: *See—*
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Pizzagalli, Remo R., to Atlas Pipe Popper Corporation, mesne. Method for emploring new pipe along previously laid pipe. 3,599,315, Cl. 29-431.
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Plessey Company Limited, The: *See—*
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Pneuman, Frederick C.; and Hale, Charles Y., to Weyerhaeuser Company. Coupling device for cargo containers. 3,599,824, Cl. 220-23.4

Pociask, Joseph Robert: *See—*
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Polaroid Corporation: *See—*
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Downey, Rogers B., 3,600,071.
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Polevy, John H.: *See—*
Holland, Dewey G.; Moyer, Ronald C.; Polevy, John H.; and Waldo, Robert A.,3,600,433.

Poliakovsky, Lev Judelevich; Kovaeva, Lidia Petrovna; Balandin, Stanislav Markovich; and Kornev, Igor Vladimirovich. Twisting and forming device for a pneumatic spinning system. 3,599,414, Cl. 57-58.89

Polichette, Joseph: *See—*
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Pollak, Robert J., to Allis-Chalmers Manufacturing Company. Gyratory crusher with setting indicator. 3,599,883, Cl. 241-213.

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Polymer Processing Research Institute Ltd.: *See—*
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Yazawa, Masahide, 3,600,488.

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Polytop Corporation: *See—*
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Polzer, Allen F. Automatic lawn sprinkler control. 3,599,669, Cl. 137-608.

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Portal, Guy: *See—*
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Porter, Frank W.; and Ferrara, Achille K., to Ultramatic Equipment Co. Rotary finishing machine. 3,599,374, Cl. 51-7.

Porter, Lawrence C.; and Graves, Kenneth E., to Upjohn Company, The. Method and apparatus for determining the true difference or error between two frequencies. 3,600,563, Cl. 235-180.3

Porter, Selby W., to Kalium Chemicals Limited. Method of mining subterranean rubble piles. 3,600,039, Cl. 299-5.

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Price, Gareth G.; Wheelahan, Bernard; and Stafford-Gaffney, Simon D. E., to Shell Oil Company. Method for determining the strength of emulsions. 3,600,133, Cl. 23-230.

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Randall, David I.; and Stahl, Clarence R., to GAF Corporation. Bis aliphatic phosphonic acid anhydrides. 3,600,435, Cl. 260-502.4

Rangus, Ernest C.; and Krishnakumar, Suppayan M., to Electro Engineering Products Co., Inc. Rotary spray gun. 3,599,868, Cl. 239-218.5

Ransom, Stephen; and Bainbridge, William N., to British Aircraft Corporation. Retractable in-flight refuelling probe. 3,599,907, Cl. 244-135.

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Read, Owen Rodwell. Tape loading apparatus. 3,599,393, Cl. 53-245.
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Reuter, Martin; Beermann, Claus; and Linke, Fritz, to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning. Process for the flame-proofing of fibrous materials consisting of polyester fibers and cellulose fibers. 3,600,219, Cl. 117-136.
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Richardson, Donald, to North American Rockwell Corporation. Defective strand detector means for braiding machines. 3,599,529, Cl. 87-19.
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Richter, Gunther M., to Bunker-Ramo Corporation, The. Vibration resistant contact structure for coaxial switch. 3,600,542, Cl. 200-166.
Richter, Johan C. F. C., to Aktiebolaget Kamyr. Cellulose bleach tower with means for spreading a bleaching agent therein. 3,599,449, Cl. 68-181.
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Romer, Bendt Wegge; Meisingset, Lars; Valbjorn, Knud V.; and Knudsen, Jorgen Dahlman, to Danfoss A/S. Hermetically enclosed refrigerating machine. 3,600,110, Cl. 417-312.

Ronning, Jacob A. Undercutting tool. 3,599,330, Cl. 30-300.

Ronzoni, Isidoro; and Miani, Mario, to Montecatini Edison S.p.A. Equipment for the injection molding of thermoplastic materials having a high content of volatile substances. 3,599,292, Cl. 18-30.

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Roszelle, Wayne O., to Marathon Oil Company. Use of surfactant foam for recovery of petroleum. 3,599,715, Cl. 166-273.

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Sams, Fred V., deceased (by Sams, Anges, executrix); and Wellons, Charles L. Oven for burning waste wood products. 3,599,609, Cl. 122-2.

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Sato, Koichi; Niki, Akira; and Morimoto, Masanobu, to Asahi Kasei Kogyo Kabushiki Kaisha. Coating compositions of chlorosulfonated polyethylene and chlorinated isotactic polypropylene. 3,600,469, Cl. 260-897.

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Saxena, Arjun N., to Sprague Electric Company. Hot carrier diode having low turn-on voltage. 3,599,323, Cl. 29-590.

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Schaum, Helmut; Emde, Hans; and Benedikter, Kurt, to Bunawerke Huls Gesellschaft mit beschrankter Haftung, mesne. Process for the manufacture of amorphous copolymers. 3,600,368, Cl. 260-80.78

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Schneble, Frederick W., Jr.; Leech, Edward J.; and Polichette, Joseph, to Photocircuits Division of Kollmorgen Corporation. Metallization of insulating substrates. 3,600,330, Cl. 252-430.
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Slaven, John Greenwood. Couplings for trailers. 3,600,006, Cl. 280-434.

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Smith, Elwin L. Method and apparatus for plugging furnace taps. 3,599,953, Cl. 266-42.

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Smith, Luke J., Jr.; and Pottern, Alvin R., to Milton Bradley Company. Transparency holder and viewing device. 3,600,079, Cl. 353-120.

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Sollecito, Vito; and Cavolina, Thomas. 'Easy find' embouchure attachment to flute or piccolo and like instruments. 3,599,526, Cl. 84-384.
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Vitale, Benedict F., to Sylvania Electric Products, Inc. Locating device for temperature compensated parallax barrier supporting system. 3,600,622, Cl. 313-85.

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